TETRA TECH

August 15, 2011

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Removal Site Evaluation and Preliminary Assessment**
Rotary Drilling Supply Site, Inc., Crystal City, Missouri
CERCLIS ID No: MON000706201
U.S. EPA Region 7 START, Contract No. EP-S7-06-01, Task Order No. 0214
Task Monitors: Jamie Bernard-Drakey, EPA Site Assessment Manager
Jim Silver, On-Scene Coordinator

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the enclosed Removal Site Evaluation/Preliminary Assessment Report for the above-referenced facility, incorporating comments from the EPA Task Monitors. If you have any questions or comments regarding this submittal, please contact the project manager at (636) 387-2174.

Sincerely,

for Ann Marie Pohlman
START Project Manager

for Ted Faile, PG, CHMM
START Program Manager

Enclosures

RCRA

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REMOVAL SITE EVALUATION/PRELIMINARY ASSESSMENT
ROTARY DRILLING SUPPLY SITE, INC.
CRYSTAL CITY, MISSOURI
CERCLIS ID No. MON000706201

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0214

Prepared For:

U.S. Environmental Protection Agency
Region 7
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August 15, 2011

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1.0 INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Region 7 Superfund Technical Assessment and Response Team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct an integrated Removal Site Evaluation/Preliminary Assessment (RSE/PA) at the Rotary Drilling Supply, Inc., (RDS) site in Crystal City, Missouri. The project was assigned under START Contract No. EP-S7-06-01, Task Order No. 0214. The purpose of the RSE was to determine if a release of a hazardous substance, pollutant, or contaminant has occurred at the site that warrants a removal action. The purpose of the PA was to assess the relative threat to human health and the environment associated with actual or potential releases of hazardous substances at the site.

2.0 SITE DESCRIPTION

The location, description, operational history, previous investigations, and waste characteristics associated with the RDS facility, along with a summary of prior regulatory involvement, are discussed below.

2.1 SITE LOCATION

RDS is located at 1150 South Truman Boulevard in Crystal City, Missouri. The site is included on the 1982 Festus, Missouri, North and West U.S. Geological Survey (USGS) 15-minute topographic map (USGS 1982) (see Appendix A, Figure 1). The site lies within a "civil colony," defined as an area of land to which title was conferred by a predecessor government and confirmed by the U.S. Government after the territory in which it is situated was acquired by the United States (National Atlas 2010). The approximate geographic coordinates for the central portion of the site are 38.206211 degrees north latitude and 90.392061 degrees west longitude.

The site is located in the southern portion of Crystal City, and can be accessed from South Truman Boulevard, also known as Highway 61/67, from either the north or the south. Based on the USGS topographic map, the RDS property is about 400 feet above mean sea level (amsl). The topographic gradient of the site area is generally to the east-southeast toward Plattin Creek, which drains into the Mississippi River approximately 2.4 miles northeast of the site. A railroad track is on the east side of the property, and a tributary to Plattin Creek is on the south side. The site is located within the 100-year floodplain of the Mississippi River (Federal Emergency Management Agency [FEMA] 2011). The site encompasses approximately 13 acres, with various fill materials covering approximately 10 to 12 acres.

2.2 SITE DESCRIPTION

The 22 geologic formations exposed in Jefferson County range in age from Cambrian to Pennsylvanian (USDA 2011). The Cambrian rocks that crop out are composed of massive dolostone. The Ordovician system is exposed in almost three-quarters of the county; those rocks have had a significant role in the economic growth and development of the area. Quarries in limestone and dolostone have furnished building stones, aggregate, and cement for bridges, highways, and buildings. Sand mined in the St. Peter Sandstone is used by the glass industry (USDA 2011). The Devonian system is represented by a narrow band of sandstone, shale, and limestone that crosses the northeastern part of the county. The Mississippian system consists primarily of limestone and cherty limestone. The Pennsylvanian system consists of reddish-brown sandstone and bluish-gray to purple shale (USDA 2011).

Geologic units consist of flat to gently dipping bedrock dominated by dolostone, sandstone, and limestone formations. A slight regional dip of 1 to 2 degrees to the northeast has been altered by northwest-southeast trending folds and faults, where bedrock dip is over 10 degrees (USDA 2011).

Jefferson County is divided into seven physiographic regions. The regions have landscape shapes controlled by separate geologic units with variable bedding thickness, weatherability, and time of deposition. They vary from narrow ridgetops with steep hills and narrow valleys to gently rolling uplands. The highest point in the county is on Vinegar Hill, at 1,060 feet amsl. The lowest point is in the Mississippi River bottom, at 385 feet amsl (USDA 2011).

2.3 OPERATIONAL HISTORY, PREVIOUS INVESTIGATIONS, AND WASTE CHARACTERISTICS

The 13-acre facility parcel is currently owned by RDS. The business primarily performs sales and service for rotadrills and compressors. Coal fly ash generated by Ameren power plants, sandbags from the Midwest flood of 1993, and other fill materials have been deposited at the site (U.S. Army Corps of Engineers [USACE] 2010). No previous environmental investigations are known to have occurred on site. According to information in an EPA Region 7 Clean Water Act (CWA) Enforcement Program (WENF) trip report, the owner wants to develop the property for commercial use, including plans to lease or sell 2 acres of land for construction of a bank building (EPA 2010).

2.4 REGULATORY INVOLVEMENT

The following is a summary of prior regulatory involvement at the site.

2.4.1 U.S. Army Corps of Engineers

On March 1, 2010, USACE issued a Notice of Violation (NOV) to the owner. The notice stated that placement of the fill material on the property required a Section 404 Permit, and that Section 404 of the CWA had been violated (USACE 2010). The notice also stated that a review of resource maps and aerial photographs indicated the area contained a stream, forested wetland, and lake/wetland habitat, all of which are waters of the United States (USACE 2010).

2.4.2 Missouri Department of Natural Resources

A letter from the Missouri Department of Natural Resources (MDNR) dated June 30, 2010, was issued to the property owner, regarding "Improper Placement of Fly Ash Fill in a Wetland" (MDNR 2010a). The letter stated that on June 11, 2010, a site visit and meeting at the RDS property had been attended by representatives from MDNR, Ameren, and Mineral Resources Technologies (MRT), as well as the property owner. The letter also stated that MRT had provided the fly ash without cost to the property owner and paid for hauling the material to the site. Heavy equipment had been contracted by the property owner to distribute the material across the property and level it to its current elevation (MDNR 2010a). The letter also stated that fly ash is not considered "clean fill" under the Solid Waste Management Law and Regulation. The MDNR Solid Waste Management Program (SWMP) regulates fly ash as a solid waste (MDNR 2010a). The fly ash is considered a regulated solid waste and may be placed only in a permitted landfill or handled under the conditions of a properly managed beneficial use exemption or other permit exemption (MDNR 2010a).

2.4.3 U.S. Environmental Protection Agency

On April 15, 2010, personnel from USACE and the EPA Region 7 CWA Enforcement Program met with the owner at the site to discuss EPA's involvement in the matter regarding the fill material. According to USACE, fill material had been brought to the site after the flood of 1993, and about 5.8 acres of wetland had been filled since 2003.

The most recent fill material (fly ash) had originated from Ameren, a nearby coal-fired power plant. According to information in the WENF trip report, new fill material was observed along the north, east, and south perimeters of the property; the fill material was approximately 30 feet high (EPA 2010). The RDS site was entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database in October 2010 as ID number MON000706201.

3.0 INVESTIGATIVE EFFORTS – RSE/PA SAMPLING

Section 3.0 discusses the current RSE/PA field sampling and associated quality assurance (QA)/quality control (QC) activities performed at the RDS facility.

The general objectives of the RSE/PA were to determine whether any threats to human health or the environment exist as a result of releases to soil and surface water, and to assess the need for a removal action. A site-specific Quality Assurance Project Plan (QAPP) in support of the RSE/PA activities had been approved by EPA prior to conducting the sampling (Tetra Tech 2010). Field activities were conducted in accordance with the approved QAPP, except where noted in this report.

START Team Members (STM) Ann Marie Pohlman, Christy Engemann, and Cosmo Canacari (Geoprobe® operator) conducted RSE/PA sampling activities on February 14 and 15, 2011. START contacted several landowners and obtained access to collect sediment and surface water samples from their properties prior to initiating the field activities.

Along with surface water and sediment sampling, field activities included sampling surface and subsurface fill material, consisting mostly of the coal fly ash. Subsurface sampling was conducted using Geoprobe® direct-push technology (DPT) equipment.

A Site Layout Map is included as Figure 2 in Appendix A. Photographs documenting site activities are included in Appendix B, and sampling activities were recorded in a site logbook, a copy of which is included in Appendix C. Geoprobe® boring logs are included in Appendix D. Samples for analytical services request (ASR) 5198 were shipped overnight on February 16, 2011, via Federal Express to the EPA Region 7 laboratory. Field sheets and chain-of-custody records are included in Appendix E, and analytical results are included in Appendix F.

3.1 SOURCE SAMPLING

A biased or judgmental sampling scheme was followed to select source sampling locations at the RDS facility, based on site reconnaissance observations and background information about the facility. Sampling locations are illustrated on Figure 3 in Appendix A. On February 14, 2011, START collected six subsurface and three surface samples of fly ash fill material at the site. The subsurface samples were collected using a Geoprobe® DPT apparatus, and the surface samples were collected using a stainless steel garden trowel.

The Geoprobe® boring samples were collected at various depths ranging from 0 to 26 feet below ground surface (bgs), and contained visibly different layers of fill material. Most of the samples consisted of sandy, rocky, tan-colored fly ash. Other samples consisted of dark brown, fine-grained fill material, gravel, clay, sand, and shot rock. By use of a stainless steel garden trowel, surface samples were collected from 0 to 2 inches bgs at two locations, and one sample was collected from a small fly ash pile (see Tables 1 and 2).

For each sample, three 8-ounce (oz) jars were filled. The samples were placed into a cooler, where they were stored at or below 4 degrees Celsius (°C), pending submittal to the EPA Region 7 laboratory. The nine fly ash samples were submitted to the EPA Region 7 laboratory to be analyzed for Target Analyte List (TAL) metals (including mercury & boron), leachable metals according to the Toxicity Characteristic Leaching Procedure (TCLP), and polycyclic aromatic hydrocarbons (PAH).

Analytical Data Summary

Metals – Sample concentrations were compared to EPA Regional Screening Levels (RSL) for industrial and residential soils, and to Superfund Chemical Data Matrix (SCDM) benchmarks. Metals concentrations were also compared to available U.S. Geological Survey (USGS) county mean concentrations (USGS 2010). For those analytes where mean concentrations were provided by USGS, one or more source samples exceeded those concentrations for all elements except lead and manganese (See Table G-1 in Appendix G).

Arsenic was detected in all source samples collected at concentrations ranging from 3.8 mg/kg (RDS-SB-1) to 56.2 mg/kg (RDS-SB-6). Eight of the nine samples collected exceeded the Jefferson County mean arsenic concentration of 6.292 mg/kg. Arsenic exceeded the EPA RSLs for industrial and residential soils, and the SCDM cancer risk screening concentration (CR), in all samples.

Sample RDS-SB-4 collected from a depth of 24 to 26 feet bgs contained the highest concentrations of aluminum (62,000 mg/kg), beryllium (4.0 mg/kg), boron (590 mg/kg), chromium (59.1 mg/kg), cobalt (19.3 mg/kg), copper (142 mg/kg), manganese (223 mg/kg) , nickel (50.7 mg/kg), and vanadium (167 mg/kg). Sample RDS-SB-6 collected from a depth of 13 to 15 feet bgs contained the highest concentrations of arsenic (56.2 mg/kg), cadmium (0.89 J mg/kg), lead (58.9 mg/kg), and zinc (137 mg/kg). Sample RDS-SB-5 collected from a depth of 0 to 2 feet bgs contained the highest concentrations of barium (4,350 mg/kg), and mercury (0.35 J mg/kg). The highest selenium concentration of 6.0 mg/kg was reported in sample RDS-SB-2 collected from a depth of 10 to 12 feet bgs. In general, the lowest concentrations for most analytes was in RDS-SB-1 collected from a depth of 0 to 2 feet bgs.

TABLE 1

SUBSURFACE SAMPLE SUMMARY (FILL MATERIAL)
RDS SITE
FEBRUARY 2011

Borehole Number	EPA Sample Number	Boring Location	Latitude	Longitude	Well Completed	Depth (ft bgs)	Time
RDS-SB-1	5198-1	West-central part of the source pile; refusal at 4 feet bgs	38.20679	90.39288	2-14-11	0-2	09:37
RDS-SB-2	5198-2	175 feet east of RDS-SB-1	38.20677	90.39229	2-14-11	10-12	10:15
RDS-SB-3	5198-3	175 feet east of RDS-SB-2	38.20671	90.39163	2-14-11	7-9	11:05
RDS-SB-4	5198-4	East-central part of the source pile	38.20656	90.39117	2-14-11	24-26	12:10
RDS-SB-5	5198-5	South-central part of the source pile, near equipment	38.20624	90.39207	2-14-11	0-2	12:45
RDS-SB-6	5198-6	North-central part of the source pile, near smaller piles	38.20701	90.39195	2-14-11	13-15	13:20

Notes:

bgs	Below ground surface	RDS	Rotary Drilling Supply
EPA	U.S. Environmental Protection Agency	SB	Soil boring
ft	Feet		

TABLE 2

SURFACE SAMPLE SUMMARY (FILL MATERIAL)
RDS SITE
FEBRUARY 2011

Sample Number	EPA Sample Number	Sample Location	Latitude	Longitude	Date	Time
RDS-SF-1	5198-7	Small pile on north end of the property	38.20696	90.39188	2-14-11	13:39
RDS-SF-2	5198-8	Southeast side of property	38.20606	90.39151	2-14-11	13:50
RDS-SF-3	5198-9	West side of property	38.20658	90.39273	2-14-11	14:00

Notes:

EPA U.S. Environmental Protection Agency
RDS Rotary Drilling Supply

TCLP Metals – None of the samples exceeded any TCLP regulatory levels for metals (see Table G-2 in Appendix G). Based on the sampling conducted, the fill material does not classify as a RCRA characteristic waste for toxicity.

PAHs – All source samples were submitted for PAH analyses. No PAHs were detected at or above the reporting limits. Therefore, PAHs do not appear to be at levels of concern in the surface and subsurface fill materials.

3.2 SURFACE WATER AND SEDIMENT SAMPLING

During this investigation, surface water (SW) and collocated sediment (SD) samples were collected from four locations on the site property and two locations on adjacent properties. Table 3 lists these samples; the sample locations are illustrated in Figure 3 in Appendix A.

Four sample locations (RDS-SW/SD-3, RDS-SW/SD-4, RDS-SW/SD-5, and RDS-SW/SD-6) were selected along a small drainage pathway on the south and southeast sides of the property from which drainage eventually flows into Plattin Creek. The drainage pathway was just a few feet wide and contained less than a foot of water during sampling. One sample location (RDS-SW/SD-1) was located at the Elks' Lodge pond (Willers Lake), near the northeastern side of the property. Another sample location (RDS-SW/SD-2) was at an adjacent property on the eastern side of the railroad tracks. A field duplicate sample (RDS-SW/SD-2-FD) was also collected. Three background samples (RDS-SW/SD-7, RDS-SW/SD-8, and RDS-SW/SD-9) were collected upstream of the site at a pond on the western side of Highway 61/67, which is approximately 1/8 mile southwest of the property (see Figure 3). Because these samples were collected upstream of the facility, they are not likely affected by the source.

Surface water samples were collected by dipping a 1-liter container into the water and transferring the water to the requisite sample containers. All water samples were analyzed for TAL metals (including mercury and boron); those samples were collected in 1-liter cubitainers and preserved with nitric acid (HNO_3) to a pH <2. Three water samples (RDS-SW-1, RDS-SW-3, and RDS-SW-5) were also analyzed for PAHs; those were collected in 80-oz amber glass jugs.

TABLE 3

SURFACE WATER AND SEDIMENT SAMPLE SUMMARY
RDS SITE
FEBRUARY 2011

Surface Water Samples						
RDS-SW-1	5198-101	Elks' Lodge pond (Willers Lake) near the northeastern part of the property	38.20676	90.39066	2/15/11	11:18
RDS-SW-2 RDS-SW-2-FD	5198-104 5198-104-FD	East side of railroad tracks by a culvert	38.20551	90.39093	2/15/11	12:55
RDS-SW-3	5198-102	West side of railroad tracks by a culvert	38.20546	90.39116	2/15/11	13:10
RDS-SW-4	5198-105	West side of railroad tracks (farthest north sampling point, except for Elks' Lodge pond)	38.20575	90.39108	2/15/11	13:30
RDS-SW-5	5198-103	Southeast side of pile	38.20556	90.39127	2/15/11	13:40
RDS-SW-6	5198-106	South side of pile, in standing water	38.20550	90.39191	2/15/11	13:50
RDS-SW-7	5198-107	Background sample from pond	38.20537	90.39525	2/15/11	14:20
RDS-SW-8	5198-108	Background sample from pond	38.20523	90.39478	2/15/11	14:30
RDS-SW-9	5198-109	Background sample from pond	38.20481	90.39478	2/15/11	14:45
Sediment Samples						
RDS-SD-1	5198-16	Same as RDS-SW-1	38.20676	90.39066	2/15/11	11:18
RDS-SD-2 RDS-SD-2-FD	5198-10 5198-10-FD	Same as RDS-SW-2 and RDS-SW-2-FD	38.20551	90.39093	2/15/11	12:55
RDS-SD-3	5198-17	Same as RDS-SW-3	38.20546	90.39116	2/15/11	13:10
RDS-SD-4	5198-11	Same as RDS-SW-4	38.20575	90.39108	2/15/11	13:30
RDS-SD-5	5198-18	Same as RDS-SW-5	38.20556	90.39127	2/15/11	13:40
RDS-SD-6	5198-12	Same as RDS-SW-6	38.20550	90.39191	2/15/11	13:50
RDS-SD-7	5198-13	Same as RDS-SW-7-Background	38.20537	90.39525	2/15/11	14:20
RDS-SD-8	5198-14	Same as RDS-SW-8-Background	38.20523	90.39478	2/15/11	14:30
RDS-SD-9	5198-15	Same as RDS-SW-9-Background	38.20481	90.39478	2/15/11	14:45
QA/QC Samples						
RDS-RB	5198-111	Rinsate Sample	NA	NA	2/14/11	13:18
RDS-112-FB	5198-112-FB	Field Blank	NA	NA	2/15/11	15:00

Notes:

EPA	U.S. Environmental Protection Agency	SD	Sediment
FB	Field blank	SW	Surface water
FD	Field duplicate	QA	Quality assurance
NA	Not applicable	QC	Quality control
RDS	Rotary Drilling Supply		

Sediment samples were collected from the edge of the drainage pathway and adjacent properties following collection of the surface water sample. These samples were collected with a stainless steel garden trowel, which was decontaminated between locations. All sediment samples were collected in 8-oz. jars and analyzed for TAL metals (including mercury and boron). Three sediment samples collected in additional 8-oz. jars (RDS-SD-1, RDS-SD-3, and RDS-SD-5) were also analyzed for PAHs. All samples were placed into a cooler, where they were stored at or below 4 °C, pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary – Surface Water

Metals – Table G-3 in Appendix G presents a summary of the metals detected in the surface water samples. Results were compared to environmental benchmarks including aquatic benchmarks for fresh water from SCDM and to the concentrations of the background samples RDS-SW-7, RDS-SW-8, and RDS-SW-9, which were collected from a nearby pond on the western side of Highway 61/67.

Arsenic was detected in samples RDS-SW-3 and RDW-SW-4 at levels that exceeded the detection limits of the background samples. The detection limit was 1.0 microgram per liter (µg/L) for all three background samples. Arsenic was reported at 4.0 µg/L in sample RDS-SW-3 and 29.7 µg/L in sample RDS-SW-4. The samples did not exceed the acute SCDM Critical Maximum Concentration (CMC) or chronic Criterion Continuous Concentration (CCC) benchmark values.

Barium was detected in all downgradient samples. Results ranged from 95.0 µg/L (RDS-SW-6) to 309 µg/L (RDS-SW-4). Only the sample from RDS-SW-4 was at a concentration that was three times the background concentration of 54.7 µg/L.

Boron was detected in all samples at levels that exceeded the detection limits of the background samples. Results ranged from 119 µg/L (RDS-SW-6) to 4,040 µg/L (RDS-SW-4). Background detection limits ranged from 38.3 to 50.2 µg/L. Boron does not have any acute CMC or chronic CCC benchmark values with which to compare sample detection limits.

Chromium, cobalt, copper, and vanadium were only detected in sample RDS-SW-4 at 15.0, 3.4, 23.8 and 51.0 µg/L respectively. Chromium, cobalt and vanadium do not have any acute CMC or chronic CCC benchmark values with which to compare sample results. Copper has environmental benchmarks. The detection in sample RDS-SW-4 exceeded the benchmarks for acute CMC and chronic CCC.

Lead was detected in samples RDS-SW-1 and RDS-SW-4 at 9.9 µg/L and 31.1 µg/L, respectively. Background detection limits ranged from 1.0 to 2.6 µg/L. Samples RDS-SW-1 and RDS-SW-4 exceeded

chronic CCC, which is 2.5 µg/L. The acute CMC benchmark value was not exceeded in any of the samples.

Manganese was detected in all samples. Results ranged from 63.3 to 641 µg/L. The highest background concentration was 88.5 µg/L. Sample locations RDS-SW-1, RDS-SW-2, RDS-SW-2-FD, and RDS-SW-4 contained 641, 282, 267, and 421 µg/L manganese respectively; which were three times the background concentration.

Nickel was detected in samples RDS-SW-1, RDS-SW-3, RDS-SW-2, RDS-SW-2-FD, and RDS-SW-4 at concentrations that exceeded the background detection limits. Results ranged from 3.4 µg/L (RDS-SW-3) to 14.5 µg/L (RDS-SW-4). Background detection limits ranged from 1.8 to 2.4 µg/L. The results did not exceed the SCDM acute CMC or chronic CCC benchmark values.

Selenium was detected in samples RDS-SW-3, RDS-SW-2, RDS-SW-2-FD, and RDS-SW-4 at levels that exceeded the background samples detection limits. The detection limit was 5.0 µg/L for all three background samples. Results ranged from 7.0 µg/L (RDS-SW-2) to 25.7 µg/L (RDS-SW-4). All samples also exceeded the chronic CCC at 5.0 µg/L. An acute CMC benchmark value is not established.

Zinc was detected in sample RDS-SW-4 at 48.3 µg/L. Zinc was measured in background sample RDS-SW-7 at an estimated concentration of 7.7 µg/L.

Many metals in sample RDS-SW-4 exceeded most benchmark values and at higher levels than in the other samples. Sample RDS-SW-1, from the Elks' Lodge pond, contained elevated boron, lead, manganese, and nickel concentrations. The pile is close to the sampling location, and even with the berm located there, the metals appear to have run off to some extent into the pond. All samples had some elevated metals concentrations.

PAHs – No PAHs were detected in any of the three surface water samples analyzed for PAHs (RDS-SW-1, RDS-SW-3, and RDS-SW-5). Therefore, PAHs do not appear to be of concern in the surface water samples. The three background samples were not analyzed for PAHs.

Analytical Data Summary – Sediment

Metals – Table G-4 in Appendix G presents a summary of metals detected in the sediment samples. Results were compared to background sample concentrations in RDS-SD-7, RDS-SD-8, and RDS-SD-9, which had been collected from a nearby pond (upstream) on the western side of Highway 61/67. No benchmarks exist for sediment samples. All sediment samples collected downgradient of the RDS site

contained one or more metals at concentrations significantly above background concentrations. Only the metals that were at least three times the background concentration (if the analyte was detected in background), or above the detection limit of the background samples (if the analyte was not detected), are discussed below.

Aluminum was detected in samples RDS-SD-2, RDS-SD-4, and RDS-SD-5 at 31,000, 44,700 and 31,200 mg/kg respectively. These concentrations were three times the background aluminum concentration of 7,070 mg/kg found in sample RDS-SD-7.

Arsenic was detected in samples RDS-SD-2, and RDS-SD-4 at 20.0 and 26.8 mg/kg respectively. These concentrations were three times the background arsenic concentration of 4.3 mg/kg found in sample RDS-SD-9.

Barium was reported at elevated concentrations in all downgradient samples except RDS-SD-1, at concentrations ranging from 491 mg/kg in sample RDS-SD-6 to 3,050 mg/kg in sample RDS-SD-4. These concentrations were three times the background barium concentration of 87.2 mg/kg found in sample RDS-SD-8.

Berylium was detected in samples RDS-SD-2, RDS-SD-4, and RDS-SD-5 at 1.7, 2.5, and 1.5 mg/kg respectively. These concentrations were three times the background beryllium concentration of 0.50 mg/kg found in sample RDS-SD-8.

Boron was reported at elevated concentrations in all downgradient samples except RDS-SD-1, at concentrations ranging from 23.7 mg/kg in sample RDS-SD-3 to 193 mg/kg in sample RDS-SD-4. Boron was not detected in background with a maximum sample quantitation limit of 13.0 mg/kg.

Cadmium was detected in all samples at levels that exceeded the detection limits of the background samples. Results ranged from an estimated 0.68 mg/kg (RDS-SD-3) to 2.2 mg/kg (RDS-SD-2-FD). Background detection limits ranged from 0.43 to 0.65 mg/kg.

Chromium and copper were detected in sample RDS-SD-11 at 46.1 and 103 mg/kg respectively. Background concentration for chromium and copper were highest in sample RDS-SD-8 at 10.7 and 33.3 mg/kg respectively.

Lead was reported at elevated concentrations in all downgradient samples except RDS-SD-4 and RDS-SD-5, at concentrations ranging from 107 mg/kg in sample RDS-SD-6 to 637 mg/kg in sample

RDS-SD-2-FD. Lead was detected in background sample RDS-SD-8 at 28.7 mg/kg. The maximum lead concentration found in a source sample was 58.9 mg/kg.

Magnesium was reported at elevated concentrations in all downgradient samples except RDS-SD-1, at concentrations ranging from 10,900 mg/kg in sample RDS-SD-6 to 18,100 mg/kg in sample RDS-SD-4. Magnesium was detected in background sample RDS-SD-9 at 3.170 mg/kg.

Manganese was detected in samples RDS-SD-2 and its field duplicate RDS-SD-2-FD and RDS-SD-5 at concentrations of 1,510, 866, and an estimated 1,230 mg/kg respectively. These concentrations were all three times the background concentration of 265 mg/kg measured in RDS-SD-9.

Mercury was detected only in sample 5198-18 (RDS-SD-5) at an estimated 0.19 mg/kg. Mercury was not detected in any of the background samples.

Nickel was detected in samples RDS-SD-2-FD and RDS-SD-4 at concentrations of 31.3 and 35.5 mg/kg respectively. These concentrations were three times the background concentration of 10 mg/kg measured in RDS-SD-8.

Selenium was detected in samples RDS-SD-2, RDS-SD-2-FD, and RDS-SD-4. Results in these samples ranged from 7.1 mg/kg (RDS-SD-2-FD) to 16.5 mg/kg (RDS-SD-2). Selenium was not detected in background sediments. Background detection limits ranged from 3.0 to 4.5 mg/kg.

Sodium was detected in samples RDS-SD-2, RDS-SD-2-FD, RDS-SD-4, RDS-SD-5, and RDS-SD-6. Results in these samples ranged from 857 mg/kg (RDS-SD-6) to 5,350 mg/kg (RDS-SD-4). Sodium was not detected in background. Background detection limits ranged from 428 to 649 mg/kg.

Vanadium was detected in samples RDS-SD-2 and RDS-SD-4 at concentrations of 76.6 and 93.9 mg/kg respectively. These concentrations were three times the background concentration of 23.2 mg/kg measured in RDS-SD-7.

Zinc was detected in samples RDS-SD-1, RDS-SD-2-FD, RDS-SD-5 and RDS-SD-6 at concentrations of 183, 197, 156, and 204 mg/kg respectively. These concentrations were three times the background concentration of 50.1 mg/kg measured in RDS-SD-8.

The high results in these samples compared to the background detection limits suggest that releases of these metals to the environment may have occurred.

PAHs – No PAHs were detected in samples RDS-SD-1, RDS-SD-3, and RDS-SD-5, which were the only sediment samples analyzed for PAHs. Therefore, PAHs do not appear to be of concern in the sediment samples.

4.0 HAZARD RANKING SYSTEM FACTORS

This section discusses the sources of contamination and the contaminant migration pathways evaluated under the Hazard Ranking System (HRS).

4.1 SOURCES OF CONTAMINATION

The coal fly ash pile covers approximately 10 to 12 acres. The depth of the pile is approximately 30 feet at its deepest point. The length of the fly ash pile (north to south) is approximately 500 feet, and the width (west to east) is approximately 525 feet. The volume of the pile was calculated by determining the volume of a triangular prism: ½ base x height x length, which is 525 feet x 500 feet x 30 feet = 7,875,000/2 = 3,937,500 cubic feet (ft^3), which is equivalent to approximately 145,833 cubic yards (yd^3).

4.2 GROUNDWATER PATHWAY

This section discusses the groundwater pathway.

4.2.1 Hydrogeological Setting

The 22 geologic formations exposed in Jefferson County range in age from Cambrian to Pennsylvanian (USDA 2011). The Cambrian rocks that crop out are composed of massive dolostone. The Ordovician system is exposed in almost three-quarters of the county; those rocks have had a significant role in the economic growth and development of the area. Quarries in limestone and dolostone have furnished building stones, aggregate, and cement for bridges, highways, and buildings. Sand mined in the St. Peter Sandstone is used by the glass industries (USDA 2011). The Devonian system is represented by a narrow band of sandstone, shale, and limestone that crosses the northeastern part of the county. The Mississippian system consists primarily of limestone and cherty limestone. The Pennsylvanian system consists of reddish-brown sandstone and bluish-gray to purple shale (USDA 2011).

Geologic units consist of flat to gently dipping bedrock dominated by dolostone, sandstone, and limestone formations. A slight regional dip of 1 to 2 degrees to the northeast has been altered by northwest-southeast trending folds and faults, where bedrock dip is over 10 degrees (USDA 2011).

Jefferson County is divided into seven physiographic regions. The regions have landscape shapes controlled by separate geologic units with variable bedding thickness, weatherability, and time of deposition. They vary from narrow ridgetops with steep hills and narrow valleys to gently rolling uplands. The highest point in the county is on Vinegar Hill, at 1,060 feet amsl. The lowest point is in the Mississippi River bottom, at 385 feet amsl (USDA 2011).

The site is located in the east-central part of Missouri in the Salem Plateau groundwater province, which surrounds the St. Francois Mountains and includes all or parts of 49 counties—an area of about 24,760 square miles. Groundwater resources in the Salem Plateau groundwater province are the most extensive in the State. Two major aquifers underlie this region—the St. Francois aquifer and the Ozark aquifer (MDNR 2011a).

Overlying the St. Francois aquifer is 100 to 500 feet of low-permeability carbonate rock and shale, including the Derby-Doerun dolomites and Davis Formation. Together, they form the St. Francois confining unit. Though these units can yield small quantities of water, they are not considered a significant aquifer. Instead, they greatly limit the interchange of water between the two aquifers (MDNR 2011a).

Thick Ordovician- and Cambrian-age dolomite and sandstone units comprising the Ozark aquifer overlie the St. Francois confining unit. The Ozark aquifer consists of bedrock units from the top of the Kimmswick Limestone to the base of the Potosi Dolomite. Throughout much of the province, the Ozark aquifer is generally 800 to 1,000 feet thick, but it reaches thickness exceeding 2,000 feet locally. It is considered an unconfined aquifer in most of this region (MDNR 2011a).

The Ozark aquifer is the most widespread and widely used aquifer in Missouri. It supplies nearly all of the water-supply needs in this province. Depending on well depth and location, private domestic wells a few hundred feet deep can easily produce water ample for domestic purposes, while larger-diameter wells 1,200 to 1,500 feet deep typically can produce from 300 to more than 1,000 gallons of water per minute (MDNR 2011a).

4.2.2 Groundwater Targets

Crystal City encompasses a total area of 3.7 square miles. The population of Crystal City was 4,247 during the 2000 census. The population density is 1,136.7 people per square mile (Wikipedia 2011). Crystal City has three municipal wells that serve 4,010 people (MDNR 2011b). The wells listed come from the Center for Applied Research and Environmental Systems (CARES) database from the University of Missouri (MU). The wells listed are: Ranney–Well #1, Hospital–Well #2, and Well #3 (MU 2011).

Ranney-Well#1 is 90 feet deep and is in the alluvial aquifer. Hospital–Well #2 is 750 feet deep and is in the Ozark aquifer. Well #3 is 555 feet deep and is in the Ozark aquifer (MU 2011). The City supplies drinking water to the RDS site.

Residences within the 4-mile target distance limit (TDL) for the site are largely supplied by municipal or domestic wells. Figure 5 in Appendix A shows the 4-mile groundwater TDL for the RDS site, the registered wells within the TDL, and the coverage areas for the wells. The MDNR Certified Wells database for registered wells lists 238 domestic wells and 16 municipal wells within the 4-mile radius of the RDS site (MDNR 2010b).

The number of domestic wells listed within 0.5- to 1-mile radius of the site is 3. Domestic wells listed within a 1- to 2-mile radius of the site are 54. Within a 2- to 3-mile radius of the site are 73 domestic wells. The number of domestic wells listed within a 3- to 4-mile radius of the site is 108 (MDNR 2010b).

The number of municipal wells listed within 0.5- to 1-mile radius of the site is 3. Municipal wells listed within a 1- to 2-mile radius of the site are 6. Within a 2- to 3-mile radius of the site are 4 municipal wells. The number of municipal wells listed within a 3- to 4-mile radius of the site is 3 (MDNR 2010b).

The domestic wells within the 0.5- to 1-mile radius range in depth from 240 to 657 feet and have static water levels (SWL) ranging from 0 to 245 feet bgs. The wells were constructed between 1987 and 2005. Two of the wells are located northeast of the site, and one is located west of the site (MDNR 2010b).

The number of domestic wells within the 1- to 4-mile radius increases with distance from the site. The depth of the deepest well in the 1- to 2-mile radius is 610 feet. The SWLs range from 0 to 365 feet bgs. The wells were constructed between 1987 and 2008. Domestic wells within this radius range from west to southwest and east to southeast (MDNR 2010b). The depth of the deepest well in the 2- to 3-mile radius is 590 feet. The SWLs range from 0 to 280 feet bgs. The wells were constructed between 1987 and 2008. Most of the domestic wells within this radius range from northwest to southwest. The depth of the deepest well in the 3- to 4-mile radius is 540 feet. The SWLs range from 0 to 310 feet bgs. The wells were constructed between 1987 and 2009. Most of the domestic wells within this radius range from west to northwest (MDNR 2010b).

4.2.3 Groundwater Pathway Conclusions

No groundwater or drinking water samples were collected during the RSE/PA sampling activities. No drinking water wells are located on the western side of Plattin Creek within the city limits of Crystal City.

Private drinking water wells are located on the eastern side of Plattin Creek, between the site and the Mississippi River. Groundwater likely travels to the east toward the Mississippi River. The nearest domestic wells are located 0.5 to 1 mile east, with most of the wells within the 1- to 2-mile radius east of the site. The probability of a release from the site (via leaching) to an aquifer used to supply nearby drinking water wells is low.

4.3 SURFACE WATER PATHWAY

Based on the USGS topographic map, the RDS property is approximately 400 feet amsl. The topographic gradient of the area is generally to the east-southeast, toward Plattin Creek.

The annual precipitation for Jefferson County is about 38 inches, with about 45 percent (17 inches) falling in April through September. The heaviest one-day rainfall on record was 4 inches on October 20, 1983. The average seasonal snowfall is about 19 inches, with the highest seasonal snowfall depth of 19 inches at any one time during the period of record (USDA 2011).

4.3.1 Hydrological Setting

Drainage from the RDS site is to the east-southeast, toward the perennial stream Plattin Creek, located approximately 0.5 mile to the east. Plattin Creek flows to the northeast and drains into the Mississippi River, approximately 2 miles northeast of the RDS facility (see Appendix A, Figure 4). The site is located within the 100-year floodplain of the Mississippi River (FEMA 2011).

For the RSE/PA, six collocated surface water and sediment samples were collected either on the RDS site or on adjoining properties (see Appendix A, Figure 3). RDS-SW/SD-1 were collected from the Elks' Lodge pond (Willers Lake) near the northeastern side of the site. RDS-SW/SD-2 were collected from the east side of railroad tracks by a culvert. Field duplicates were collected here as well. RDS-SW/SD-3 were collected from the west side of the railroad tracks. RDS-SW/SD-4 were also collected from the west side of the railroad tracks (farthest north sampling point, except for Elks' Lodge pond). RDS-SW/SD-5 were collected from the southeast side of the fly ash pile (low-flow stream water). RDS-SW/SD-6 were collected from the south side of the pile (standing water). Samples RDS-SW/SD-7, RDS-SW/SD-8, and RDS-SW/SD-9 (background samples) were collected upgradient of the site from a pond on the west side of Highway 61/67.

4.3.2 Surface Water Targets

Plattin Creek is a perennial stream and flows generally northeast into the Mississippi River. Drinking water intakes within the 15-mile TDL of the probable point of entry (PPE) to Plattin Creek include two water supplies along the Mississippi River. The first water supply downstream is an industrial water supply at the River Cement Company. The second water supply downstream is a public water supply at the Ameren UE Rush Island Plant (EPA 2009). No drinking water intakes are present along Plattin Creek to the Mississippi River.

The site is located in a wetland designated as a freshwater forested shrub, according to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2011a). The designated code for the site is PFO1A, which means it is in the Palustrine System, forested class, broad-leaved deciduous subclass, water regime which is temporarily flooded (USFWS 2011b). The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, emergents, mosses, or lichens. The forested class is characterized by woody vegetation 6 meters high or taller. The subclass broad-leaved deciduous includes woody angiosperms with relatively wide, flat leaves that are shed during the cold or dry season. The water regime, classified as temporarily flooded, is characterized by surface water present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the growing season (USFWS 2011b).

The Elks' Lodge pond is classified as a freshwater pond, according to the USFWS NWI (USFWS 2011a). The designated code for the pond is PUBG, which means it is in the Palustrine System, unconsolidated bottom class, water regime which is intermittently exposed (USWFS 2011b). The Palustrine System is explained above. The unconsolidated bottom class includes all wetlands and deepwater habitats with at least 25 percent (%) cover of particles smaller than stones (less than 6 to 7 centimeters) and a vegetative cover less than 30%. The water regime, classified as intermittently exposed, is characterized by surface water present throughout the year, except in years of extreme drought (USFWS 2011b).

Endangered and proposed as endangered species known or likely to occur in Jefferson County, Missouri, include: the Indiana bat (endangered), Pallid sturgeon (endangered), snuffbox (proposed as endangered), and five other listed endangered or proposed as endangered species (USFWS 2011c). The presence of these species within the site area has not been verified; nor have critical habitat areas been delineated. Recreational fishing takes place in Plattin Creek, the Elks' Lodge pond, and in the Mississippi River. Commercial fishing may occur in the Mississippi River.

4.3.3 Surface Water Pathway Conclusions

Six collocated surface water/sediment and one field duplicate samples were collected in or adjoining the site. In sediment, most analytes detected at highest concentrations were in sample 5198-11 (RDS-SD-4). The highest level reported for each metal meeting the observed release criteria are listed below in mg/kg:

- Aluminum – 44,700
- Arsenic –26.8
- Barium –3,050
- Beryllium –2.5
- Boron – 193
- Cadmium – 2.0
- Chromium – 46.1
- Copper – 103
- Lead – 637
- Magnesium – 18,100
- Manganese – 1,510
- Mercury – 0.19
- Nickel – 35.5
- Selenium – 16.5
- Sodium – 5,350
- Vanadium – 93.9
- Zinc –204.

Because the source pile is located directly on top of wetlands, a release from it would qualify as a release to sensitive environments. Indeed, the high metals concentrations in these samples compared to the background detection limits suggest that releases of these metals to the environment have occurred.

No PAHs were detected in samples RDS-SD-1, RDS-SD-3, and RDS-SD-5 which were the only sediment samples analyzed for PAHs. Therefore, PAHs do not appear to be of concern in the sediment samples.

The drainage area that is directly south-southeast of the site drains to Plattin Creek. The tributary drains into Plattin Creek on the east side of the railroad tracks, approximately 500 feet from the site. Plattin Creek then drains into the Mississippi River.

Six collocated surface water and one field duplicate samples were collected in or adjoining the site. Sample 5198-105 (RDS-SW-4) had the highest levels of analytes reported of all samples, except for one. Manganese was reported at 641 µg/L in sample 5198-101 (RDS-SW-1). Arsenic, barium, boron, chromium, cobalt, copper, lead, nickel, selenium, vanadium, and zinc were detected in sample 5198-105 (RDS-SW-4). The metals detected and the highest level reported for each are listed below in µg/L:

- Arsenic – 29.7
- Barium – 309
- Boron – 4,040
- Chromium – 15.0
- Cobalt – 3.4
- Copper – 23.8
- Manganese – 641
- Lead – 31.1
- Nickel – 14.5
- Selenium – 25.7
- Vanadium – 51.0
- Zinc – 48.3.

Sample 5198-105 (RDS-SW-4) contained many metals that exceeded most benchmark values and at higher levels than in the other samples. Sample 5198-1 (RDS-SW-1), from the Elks' Lodge pond, had elevated barium, boron, lead, manganese, nickel, and zinc concentrations. The pile is close to the sampling location, and even with the berm located there, the metals appear to have run off to some extent into the pond. All samples contained some elevated metals concentrations.

No PAHs were detected in any of the three surface water samples analyzed for PAHs (5198-101/RDS-SW-1, 5198-102/RDS-SW-3, and 5198-103/RDS-SW-5). Therefore, PAHs do not appear to be of concern in the surface water samples. The three background samples were not analyzed for PAHs.

4.4 SOIL EXPOSURE AND AIR PATHWAYS

Arsenic was detected in all surficial fill samples at concentrations between 8.9 and 18.2 mg/kg. These arsenic concentrations exceeded EPA's RSLs for industrial and residential soil of 1.6 mg/kg and 0.39 mg/kg, respectively, and the SCDM CR of 0.43 mg/kg. Only one arsenic concentration was less than the USGS mean arsenic concentration of 6.292 mg/kg reported for Jefferson County (USGS 2010). The majority of the surface fill samples also exceeded the USGS background levels for aluminum, calcium, copper, iron, magnesium and sodium. No county mean concentrations were provided by USGS for barium, boron, chromium, cobalt, nickel, or vanadium. These concentrations indicate releases of those metals may have occurred at the site. No PAHs were detected at or above the reporting limits in the surface fill samples.

The site is located in a commercial area without any residences nearby, and potential for exposure to workers is minimal. However, the RDS facility is not fenced, so exposure to contaminated fill to trespassers or visitors may be possible. The air exposure pathway was not evaluated. Air samples were not collected for the RSE/PA, based on the low probability of airborne contaminants at levels of concern at the site.

5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 *Code of Federal Regulations* 300.415 (b) (2)] authorizes EPA to consider emergency response actions at those sites that pose an imminent threat to human health or the environment. Although the RDS facility is not fenced, allowing potential exposure to areas of contaminated fill on the site property, no Superfund emergency response activities appear warranted.

6.0 SUMMARY

The RDS site is located at 1150 South Truman Boulevard in Crystal City, Missouri. The site is included on the 1982 Festus, Missouri, North and West USGS 15-minute topographic map (USGS 1982) (see Appendix A, Figure 1). The site lies within a "civil colony," defined as an area of land to which title was conferred by a predecessor government and confirmed by the U.S. Government after the territory in which it is situated was acquired by the United States (National Atlas 2010). The approximate geographic coordinates for the central portion of the site are 38.206211 degrees north latitude and 90.392061 degrees west longitude.

The site covers approximately 13 acres and is currently owned by RDS. The business primarily performs sales and service for rotadrills and compressors. Coal fly ash generated by Ameren power plants, sandbags from the flood of 1993, and other materials have been used as fill materials on the site (USACE 2010). No cleanup activities are known to have occurred at the site. According to information in an EPA Region 7 CWA Enforcement Program trip report, the property owner wants to develop the area for commercial use, including the lease/sale of 2 acres for construction of a bank building (EPA 2010).

On March 1, 2010, USACE issued a NOV to the property owner. The notice stated that the fill activities that had occurred on the property required a Section 404 Permit, and that past filling activities violated Section 404 of the CWA (USACE 2010). The notice also stated that a review of resource maps and aerial photographs indicated that the area of concern contained a stream, forested wetland, and lake/wetland habitat. All of these areas are considered waters of the United States (USACE 2010).

The general objectives of this RSE/PA were to determine whether any threats to human health or the environment exist as a result of releases to soil and groundwater, and to assess the need for a removal action.

The pertinent HRS factors associated with the RDS site are as follows:

- The source pile is located directly on top of wetlands, and therefore a release from it would qualify as a release to sensitive environments.
- Surface and subsurface source samples (fly ash) exceeded ecological and health-based benchmarks for metals. The metals of concern include arsenic, copper, lead, and selenium.

- All metal analyzed for with the exception of antimony, beryllium, cadmium, mercury, silver and thallium were reported in one or more surface water sample at concentrations significantly above background levels. Copper, lead, and selenium exceeded ecological-based benchmarks in surface water samples. Sample RDS-SW-1, collected from the Elks' Lodge pond near the site, contained elevated boron, lead, manganese, and nickel concentrations. The fly ash pile is close to that sampling location, and even with a berm to restrict runoff in the area, it appears that metals from the site may have impacted the pond. Multiple metals in RDS-SW-4, collected near the southeast corner of the fly ash pile, exceeded detection limits and health-based benchmarks. Therefore, metals from the pile appear to have been released to surface water.

- Elevated levels of metals have also been detected in sediment samples collected near the site.

6.1 REMOVAL CONSIDERATIONS

Analytical results obtained during the RSE/PA should be evaluated by EPA risk assessors to determine whether the levels and extent of contamination at the site present an unacceptable risk to human health and the environment that warrants a removal action. If a removal action is deemed necessary, it could include installation of restrictive fencing to prevent exposure to fly ash used as fill material, as well as excavation, capping, or treatment of approximately 145,833 yd^3 of fly ash on the site property. A RSE form has been completed for the site and is included as Appendix H.

6.2 PRE-REMEDIAL CONSIDERATIONS

Additional surface water and sediment sampling is recommended for EPA considerations, to determine whether a release to Plattin Creek has occurred. Groundwater sampling is not recommended because probability of risk from groundwater is low, considering the contaminants and distances to wells.

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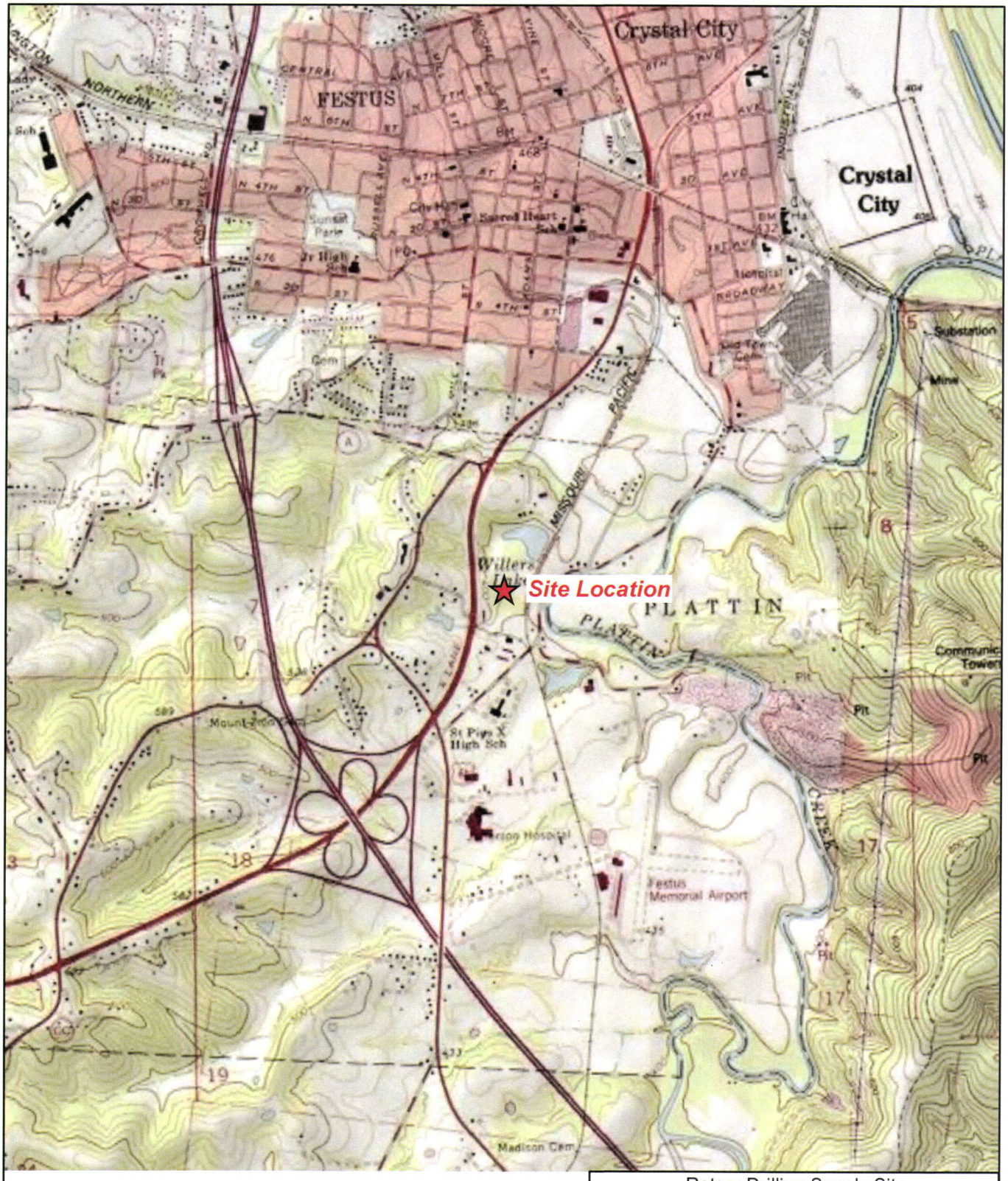
APPENDIX A

FIGURES



Source: USGS Festus, Missouri 7.5 Minute Topo Quad, 1982

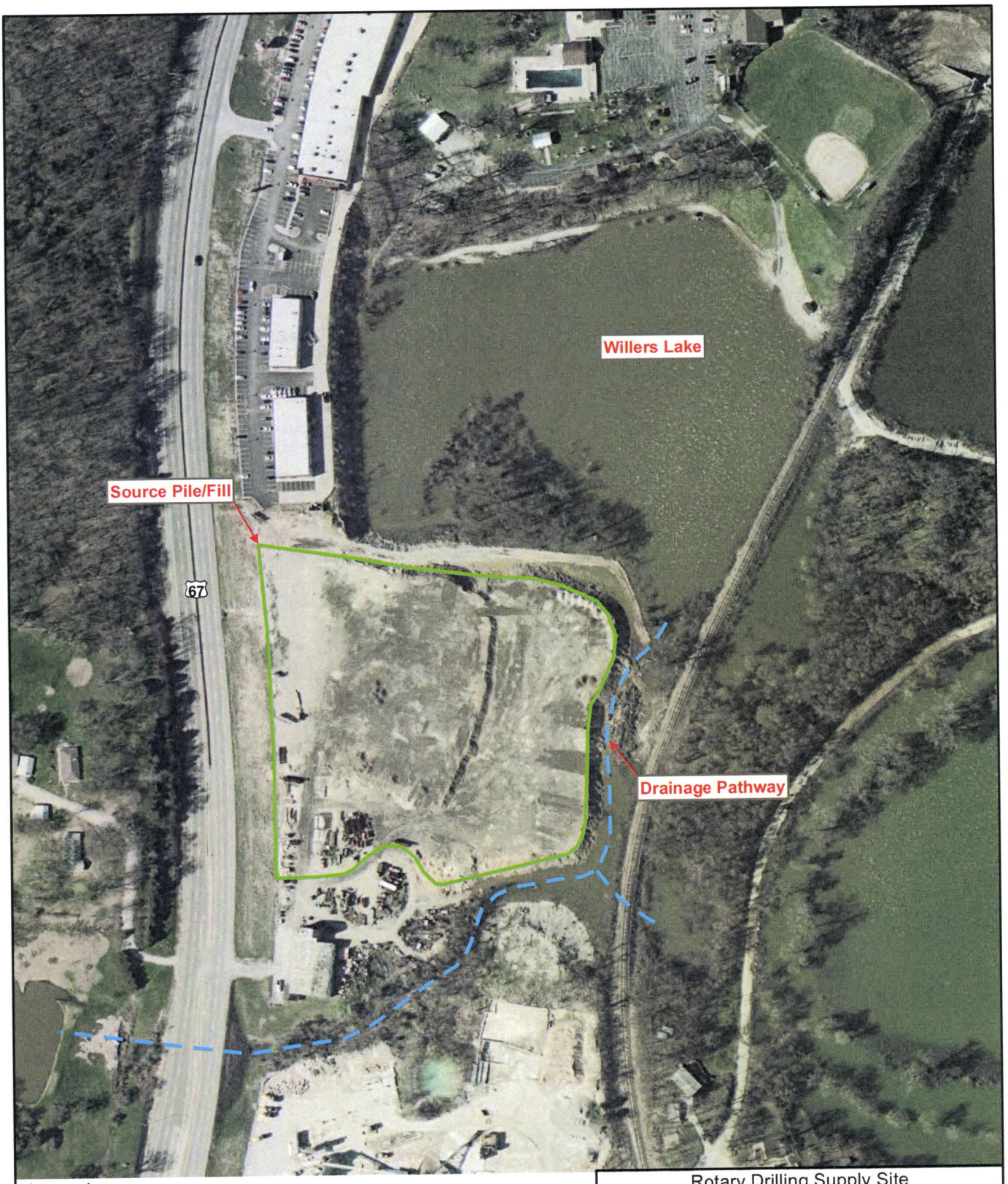
Rotary Drilling Supply Site
1150 South Truman Boulevard
Crystal City, Missouri

Figure 1
Site Location Map

TETRA TECH EM INC.

Date: 12/02/10 Drawn By: Nick Wiederholt Project No: X9004.L.10.0214.000

X:\GIS\9004\0214\000\Projects\mxd\Figure1.mxd



Legend

- Drainage pathway
- Source pile/fill

N

0 125 250

Feet

Source: ESRI World Imagery, USGS, 2008

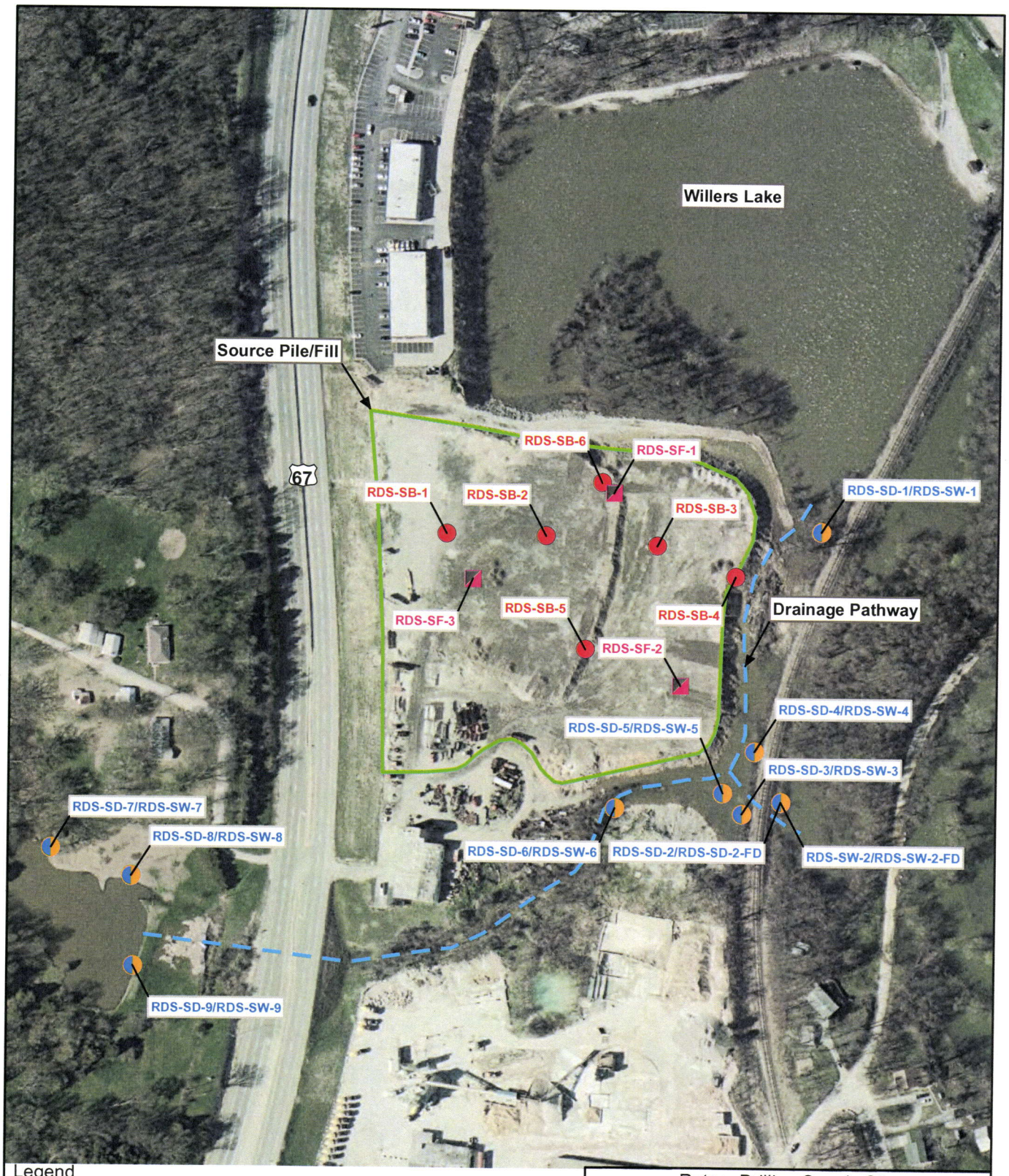
Rotary Drilling Supply Site
1150 South Truman Boulevard
Crystal City, Missouri

Figure 2
Site Layout Map

TETRA TECH EM INC.

Date: 08/01/11 Drawn By: Nick Wiederholt Project No: X9004.L.10.0214.000

X:\G\9004\0214\000\Projects\mxd\Figure2.mxd



Legend

- Sediment / surface water sample location
- Soil boring sample location
- Surface fly ash sample location
- Drainage pathway
- Source pile/fill

Source: ESRI World Imagery, USGS, 2008

N

0 115 230

Feet

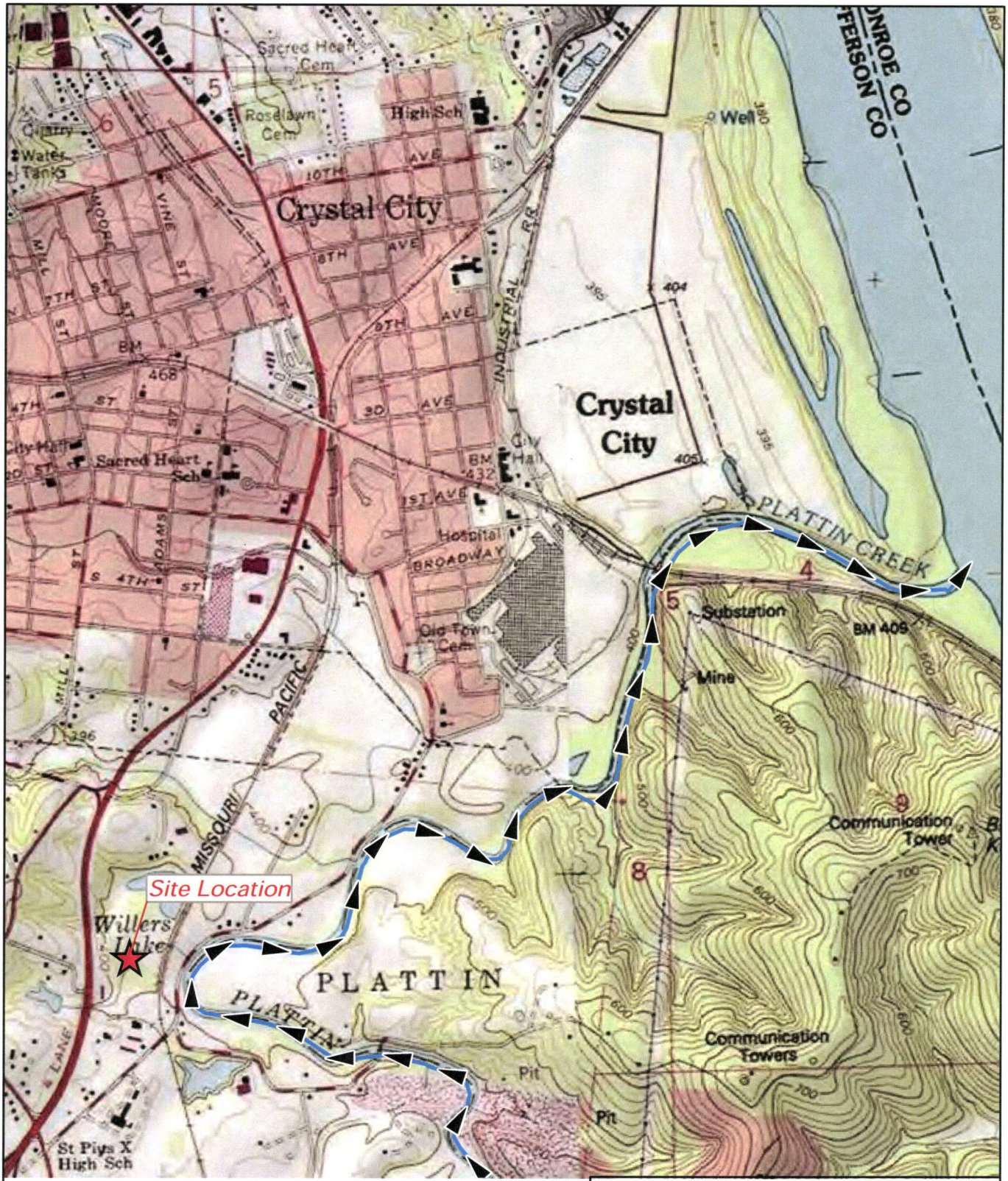
Rotary Drilling Supply Site
1150 South Truman Boulevard
Crystal City, Missouri

Figure 3
Sampling Location Map

TETRA TECH EM INC.

Date: 08/01/11 Drawn By: Nick Wiederholt Project No: X9004.L.10.0214.000

X:\G\9004\0214\000\Projects\mxd\Figure3.mxd



Source: USGS Festus, Missouri 7.5 Minute Topo Quad, 1982

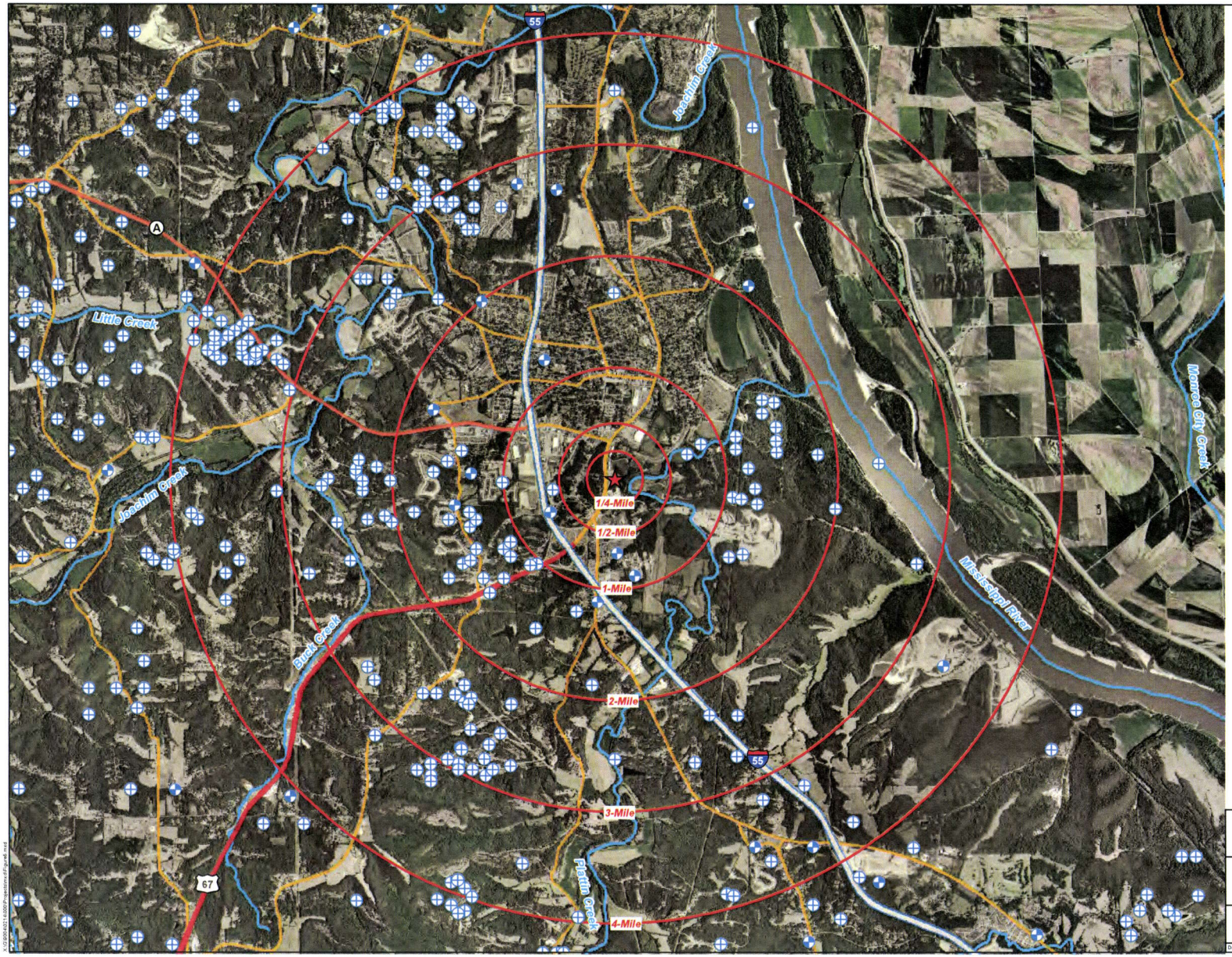
Rotary Drilling Supply Site
1150 South Truman Boulevard
Crystal City, Missouri

Figure 4
Plattin Creek Water Flow

TETRA TECH EM INC.

Date: 05/29/11 Drawn By: Nick Wiederholt Project No: X9004.L.10.0214.000

X:\G\9004\0214\000\Projects\mxd\Figure4.mxd



Legend

- Site location
- Domestic well location
- Public water supply well location
- Interstate highway
- Route highway
- State highway
- Major road
- Stream/River
- Radius ring

N

0 2,250 4,500

Feet

Source: ArcGIS Online, Bing Maps Aerial Imagery, 2010; ESRI Data Maps, 2007; HSIP Gold, 2007 MSDIS, Missouri Department of Natural Resources, Certified Wells Database, 2010

Rotary Drilling Supply Site
1150 South Truman Boulevard
Crystal City, Missouri

Figure 5

4-Mile Well Radius Map

TETRA TECH EM INC.

Date: 07/21/11 Drawn By: Nick Wiedenhuft Project No.: X9094.L10.0214.000

APPENDIX B

PHOTOGRAPHIC LOG

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows the coal fly ash pile looking northeast.	1
	CLIENT	EPA	Date 11/30/10
Direction: Northeast	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows the drainage pathway on the east side of the property.	2
	CLIENT	EPA	Date 11/30/10
Direction: South	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a berm between the coal fly ash pile and the Elks' pond (Willers Lake).	3
	CLIENT	EPA	Date 11/30/10
Direction: Northwest	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows the coal fly ash pile, facing east.	4
	CLIENT	EPA	Date 2/14/11
Direction: East	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows smaller coal fly ash piles on the property, facing northeast.	5
	CLIENT	EPA	Date 2/14/11
Direction: Northeast	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a Geoprobe soil sample from RDS-SB-2, from a depth of 0 to 4 feet below ground surface (bgs).	6
	CLIENT	EPA	Date 2/14/11
Direction: NA	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000 Direction: South	DESCRIPTION	This photograph shows Geoprobe sampling at location RDS-SB-2.	7
	CLIENT	EPA	Date 2/14/11
	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000 Direction: NA	DESCRIPTION	This photograph shows a Geoprobe soil sample being collected at RDS-SB-3, from a depth of 7 to 9 feet bgs.	8
	CLIENT	EPA	Date 2/14/11
	PHOTOGRAPHER	Ann Marie Pohlman	

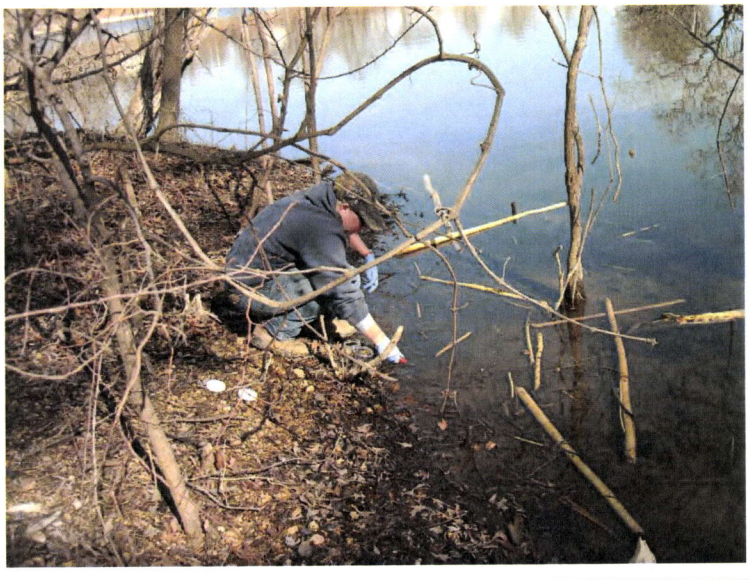
Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows Geoprobe soil samples from RDS-SB-6.	9
	CLIENT	EPA	Date 2/14/11
Direction: NA	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a Geoprobe soil sample being collected at RDS-SB-6, from a depth of 13 to 15 feet bgs.	10
	CLIENT	EPA	Date 2/14/11
Direction: North	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a source/fill sample being collected from the fly ash pile.	11
	CLIENT	EPA	Date 2/14/11
Direction: Southwest	PHOTOGRAPHER	Christy Engemann	



EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a sediment sample being collected from the Elks' pond (Willers Lake).	12
	CLIENT	EPA	Date 2/15/11
Direction: North	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows a surface water sample being collected from sample location RDS-SW-4.	13
	CLIENT	EPA	Date 2/15/11
Direction: Southeast	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000	DESCRIPTION	This photograph shows the coal fly ash pile and a drainage pathway on the south side of the property.	14
	CLIENT	EPA	Date 2/15/11
Direction: East	PHOTOGRAPHER	Ann Marie Pohlman	

Rotary Drilling Supply Site
1150 S. Truman Blvd.
Crystal City, MO 63019

EPA TASK ORDER NO. 9004.L.10.0214.000 Direction: West	DESCRIPTION	This photograph shows the pond on the west side of Highway 61/67, where background sediment and surface water samples were collected.	15
	CLIENT	EPA	Date 2/15/11
	PHOTOGRAPHER	Ann Marie Pohlman	

EPA TASK ORDER NO. 9004.L.10.0214.000 Direction: Southwest	DESCRIPTION	This photograph shows a background sediment sample being collected.	16
	CLIENT	EPA	Date 2/15/11
	PHOTOGRAPHER	Ann Marie Pohlman	

APPENDIX C

FIELD LOGBOOK

Rotary Drilling Supply Site 11-30-10

0640 Depart St. Louis for DeSoto field office.

0710 Arrive at DeSoto field office. Have a site recon walk at Rotary Drilling Supply site in Crystal City. EPA project manager Jamie Bernard-Drakey and Jim Silver will be on site with START Project Manager Ann Marie Pohlman + START field team Lauren Jackson. Work on HASP for sampling activities for this project + go to Wal-Mart for supplies for project.

1235 Depart DeSoto field office

1245 Arrive at Rotary Drilling Supply. Wait for START Jackson to review HASP + Jamie Bernard-Drakey + Jim Silver (EPA).

1255 START Jackson, EPA Jamie Bernard-Drakey & Jim Silver meet. START Jackson reads & signs HASP; go in & meet with Darrel Coleman - Owner of Rotary Drilling Supply Site Area + Adam Breeze - Darrel Coleman's lawyer. EPA Bernard-Drakey, & Silver + START Pohlman & Jackson walk the property. This site is in violation of Clean Water Act (CWA). putting coal fly ash in wetland area. EPA + START locate streams & pond (on nearby property), go over where to sample & what for. Will collect Geoprobe samples of pile (fly ash) in 5 locations (one days worth). These samples will be analyzed for TCLP metals, TAL metals (plus boron), + PAHs. Other samples include source piles/fill Samples. Sediment + surface water sampling for the first phase of sampling. Maybe will go back & geoprobe for groundwater or existing wells + air sampling. Depends on what we find in first phase of sampling.

1435 Off-site for St. Louis

1505 End of day.

11-30-10

Rotary Drilling Supply Site 1-5-11

0645 Depart St. Louis for DeSoto field Office.

0715 Arrive at DeSoto field Office. Going to meet EPA Jim Silver to get access to properties for Sampling. There are four properties to get access to. Since last entry, START prepared QAPP & HASP for Sampling & APR for Lab Sampling activities will begin on January 25, 2011. Sampling Should take 2 days to complete on 1-25-11 & 1-26-11.

0825 Depart DeSoto Office for Crystal City.

0835 Arrive at Elks Lodge to get access, No one here. Go to other properties to get access. No one home at 2 residential properties. Can access to property at 824 Legion Dr. Real Estate Agent will give to owners, Elks Lodge burnt down Couple of weeks ago. Will try again. Dropped off access at Elks Office.

0945 Arrive back at DeSoto field Office. Will look up phone numbers to get residential properties access. Give phone numbers to Jim; Jim Silver got ahold of James Laiben & spoke to Gladys Cook. James Laiben wants to sign access. Gladys Cook wants to talk to Son first.

1050 START Pohlman departs DeSoto Office & gets access signed by ~~James~~ James Laiben.

1115 Arrive back at DeSoto field Office. Jim stated that Gladys Cook wants to sign access. Will Stop by on way home & drop off access.

1340 Depart DeSoto. Drop off access at Gladys Cook's house in Crystal City. She wants to read access & then make a copy of it. Will mail to Jim Silver at Fenton Office location.

1415 Off site for St. Louis.

1445 End of day.

1-5-11

Rotary Drilling Supply 1-6-11

Depart St. Louis for DeSoto field office. Fuel vehicle in Fostus [illegible].

Arrive at DeSoto field office. Lab supplies for sampling are being delivered today. Getting HASP and attachments all lined up; STARI Pohlman signed HASP yesterday - 1-5-11

Done working on this for day.

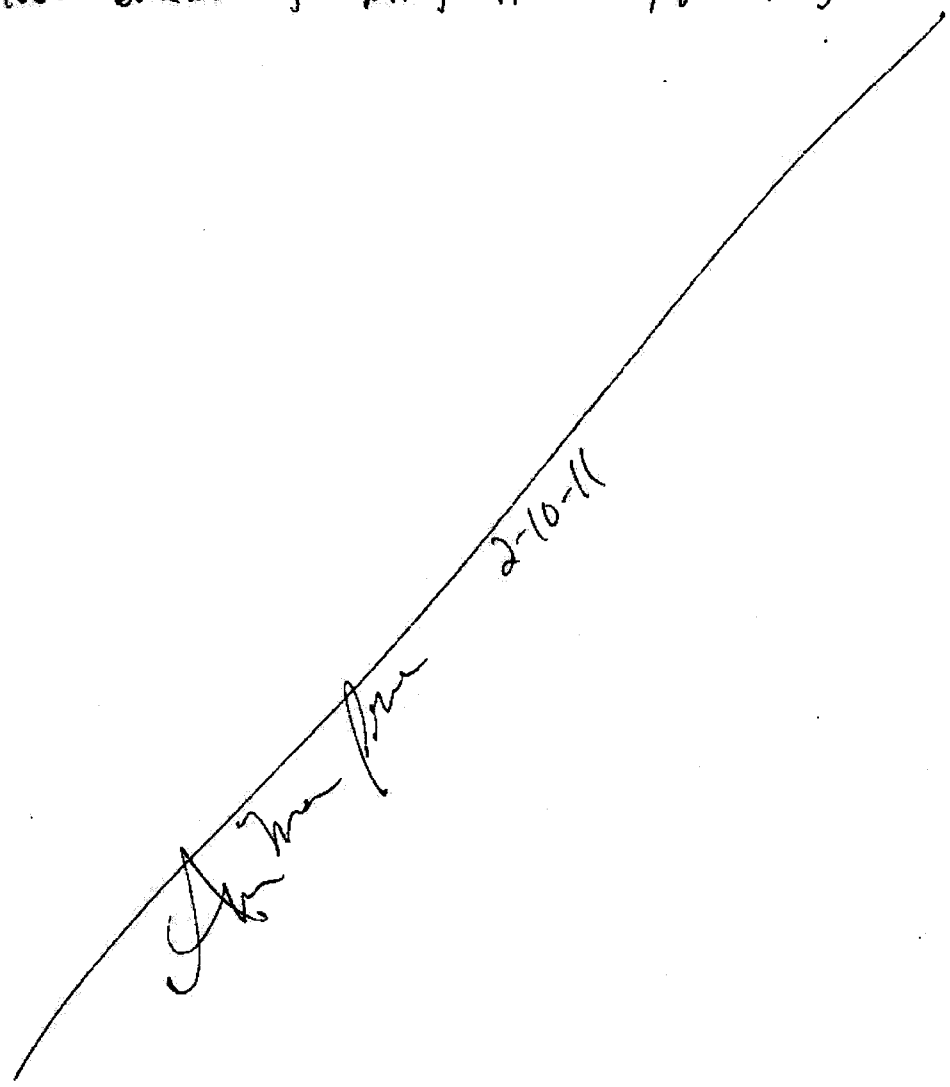
[illegible] 1-6-11

Rotary Drilling Supply 2-10-11

0705 Depart St. Louis for DeSoto field office

0735 Arrive at DeSoto field office. Get sampling & supplies ready for sampling next week. - Groundhog on Monday, February 14 & collect rest of the samples on Tuesday, Feb. 15th. Plan is to ship samples on Weds. Feb. 16th to EPA Lab.

1005 Done working on getting supplies ready for sampling



Rotary Drilling Supply 2-14-11

0615 Depart St. Louis for Desloth field Office. Refuel rental vehicle on way down.

0725 Arrive at Desloth field Office. Activities today will be Collecting Geoprobe ±surface samples from the fly ash pile. START team members Christy Engelmann + Cosmo Canacari will meet START Pohlman here at 0800. ~~Jim~~ EPA member Jim Silver will be on site as well.

~~0745~~ Depart field Office ~~this am~~

0855 Arrive at site. Notify Mr. Coleman that we are on site. Measure fill area feet N-S is 500 feet + then E to W is 525 feet. ~~Collect~~ ~~Samples at~~ from middle of E + W is 263 feet + then N+S is 114 feet on N end + 175 on South end.

0955 Collect RDS-SB-1 on far west side of Pile. Collect 0-~~2 feet~~ and 4 feet (0-2 feet) with 50% recovery. 38.20679, -90.39288. Take 4 photos at this location.

1015 Collect RDS-SB-2 down to 12 feet. 175 East of first Sample. 38.20677 -90.39229. Take 14 photos at this location. Collect Sample from 10-12 foot depth.

~~Collect RDS-SB-3 down to~~ Also

~~Collect RDS-SB-3 down to~~ Sample ~~from~~

1105 Collect RDS-SB-3. Collect from 7-9 foot depth of darker colored fill. Sample collected 175 feet east of RDS-SB-2. Coordinates are: 38.20671, -90.39162 Take 16 photos at this location.

1210 Collect RDS-SB-4. Collect Sample from 24-26 foot depth of fly ash fill-wet & light tan colored. Sample collected on east side of edge of fill by piles. Coordinates are: 38.20656, -90.39117. Take 13 photos at this location.

1245 Collect RDS-SB-5. Collect Sample from 0-2 feet depth. Sample collected on south side of property by equipment. Coordinates are: 38.20624, -90.39201 Take 3 photos 0-4 for Pictures 1-3 on the bottom in same photo

1320 Collect RDS-SB-6. Collect sample from 13-15 feet. Sample located on north side of property next to fill piles. Coordinates are: 38.20701, -90.39195. Take 12 same and photos.

1350 Collect rinsate Sample of geoprobe equipment.

Rotary Drilling Supply 2-14-11

1339 Collect surface soil and fly ash sample on northwest of Pile on property. Coordinates are: 38.20696, -90.39188 Photo document location

1350 Collect Surface Soil Sample RDS-SF-2 on SE side of property. Coordinates: 38.20606 N, -90.39151 W

1400 Collect Surface fly ash sample RDS-SF-3 on West side of property. Coordinates are: 38.20658, -90.39273. Photo document location. Photo documented Sample Location RDS-SF-2 & SF-3 and RDS-SF-1.

1430 Arrive back at field office. Unpack samples out of vehicle

1515 Off-site for St. Louis.

1545 End of day.

2-14-11

Rotary Drilling Supply 2-15-11

[illegible]5 Depart St. Louis for DeSoto field office.

[illegible]0 Arrive at DeSoto field office. Activities for today include sediment + surface water sampling, along with background samples. START Pohlman prepares for the day's activities

[illegible] START Engemann on site. START determines not enough sampling jars, so START Engemann off to Tetra Tech office in Fenton to get more.

[illegible] START Pohlman & Jim Silver depart DeSoto field office for RDS.

[illegible] Arrive at Rotary Drilling Supply. START Pohlman & OSC Silver pick out sampling locations for sediment + surface water.

[illegible]5 START Engemann back on site with extra jar containers.

Collect surface water + sediment sample at Elks Pond. Collect PAHs + MS/MSD spike samples here as well. Coordinates are: 38.20676, -90.39006. Photo document area. RDS-SD-1 and RDS-SW-1

[illegible] Lunch

[illegible] Go to sampling locations.

1255 Collect sediment & surface water & duplicate sample on east side of railroad tracks by culvert. Coordinates are: 38.20551 + -90.39093. Photo document area. RDS-SD-2, RDS-SD-2 FD, RDS-SW-2, RDS-SW-2 FD

13[illegible] Collect sediment & surface water samples for PAHs in addition to metals on west side of railroad tracks by culvert. Coordinates are: 38.20546, -90.39116. Photo documentarea. RDS-SD-3 + RDS-SW-3

1330 Collect sediment + surface water samples from west side of railroad tracks furthest north of the sampling points (except for Elks Pond). No PAHs collected at this location. Coordinates are: 38.20575, -90.39108. Photo document area. RDS-SW-4 RDS-SD-4

1340 Collect sediment + surface water for metals & PAHs on southeast side of pile. Coordinates are: 38.20556, -90.39127. Photo document area RDS-SD-5 RDS-SW-5

1350 Collect sediment + surface water for metals. No PAHs collected at this location. Location is on south side of pile in treed standing water area. Coordinates are: 38.20550, -90.39191. Photo document area. Sandbags in area of sediment sample RDS-SD-6 RDS-SW-6

Rotary Drilling Supply 2-15-11

1420 Collect surface & sediment background sample ~~and~~ from pond ~~and~~ across from property on west side of lot 167. First sample collected on southwest side of green & white Sled on northeastern side of pond. Coordinates are: 38, 20537, -90 39525. Photo documentation. RDS-SD-4 and RDS-SW-4 thru 7

1430 Collect surface & sediment background sample from pond across from property on west side of lot 167. Sample collected north side of pond south of residence. Coordinates are: 38, 20523, -90, 39478. Photo-documentation. RDS-SD-8 and RDS-SW-8

1445 Collect surface & sediment background sample from east side of pond in middle. Coordinates are: 38, 20481, -90, 39478. Photo document area. All 3 background samples analyzed for TAL metals (excluding boron and mercury). RDS-SD-9 RDS-SW-9

1505 Arrive back at field office in DeSoto. Begin preparing samples for lab shipment & empty out vehicle. Collected Field Blank at 1500. Move site for St. Louis.
End of day.

2-15-11

Rotary Drilling Supply Site 2-16-11

[redacted] Arrive at TetraTech office in Fenton. Look for bubble wrap & cooler to ship samples to lab. Only found cooler - will buy bubble wrap at Wal-Mart.

[redacted] STARS team member Christy Engleman onsite at TetraTech. Leave for DeSoto to prepare samples for ASR 5198 for lab shipment. On way down, Stop at Wal-Mart in Festus to get bubble wrap, ice, & ziplock bags.

[redacted] Arrive at DeSoto field office. Prepare ASR 5198 for lab shipments.

[redacted] Arrive back at TetraTech office in Fenton [redacted] working on project for the day.

2-16-11

APPENDIX D

GEOPROBE® BORING LOGS

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-1
Date Drilled (Start/Finish): 2/14/2011
Drilling Method: Geoprobe Boring
Drilling Company: Seagull Environmental Technologies
Elevation: ~400 feet **Total Depth:** 4 feet
Coordinates: 38.20679, -90.39288
Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann
Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Fill - gravel limestone. 50% recovery. Refusal at 4 feet.
					10				

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-2
Date Drilled (Start/Finish): 2/14/2011
Drilling Method: Geoprobe Boring
Drilling Company: Seagull Environmental Technologies
Elevation: ~400 feet **Total Depth:** 12 feet
Coordinates: 38.20677, -90.39229
Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann
Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Fill - grayish-tan, rocky, sandy.
					10				4-8 feet: Fill - gray, sandy.
					15				8-12 feet: Sandy, rocky, tan. Appears native at 12 feet. Collect sample from 10-12 feet.

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-3
Date Drilled (Start/Finish): 2/14/2011
Drilling Method: Geoprobe Boring
Drilling Company: Seagull Environmental Technologies
Elevation: ~400 feet **Total Depth:** 28 feet
Coordinates: 38.20671, -90.39163
Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann
Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Sandy, rocky, tan. 75% recovery.
					10				4-8 feet: Sandy, rocky, tan. Dark brown in 6-to-9-foot range. 50% recovery. Collect sample from 7-9 feet (dark-colored fill).
					15				8-12 feet: Silty, sandy, rocky, tan. Small dark area in 11-foot range. 100% recovery.
					20				12-16 feet: Sandy, tan. 75% recovery.
					25				16-24 feet: Sandy, tan. 75% recovery.
					30				24-28 feet: Rocky (gravel) until the last 18 inches, which is brown clay (appears native).

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-4

Date Drilled (Start/Finish): 2/14/2011

Drilling Method: Geoprobe Boring

Drilling Company: Seagull Environmental Technologies

Elevation: ~400 feet **Total Depth:** 28 feet

Coordinates: 38.20656, -90.39117

Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann

Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Fly ash fill. Light gray and tan. 80% recovery.
					10				4-8 feet: Same as above. 60% recovery.
					15				8-12 feet: Same as above. 50% recovery.
					20				12-16 feet: Fly ash fill. Rocky, tan and light brown. 75% recovery. 16-20 feet: Fly ash fill. Light gray, very wet. 100% recovery.
					25				20-24 feet: Fly ash fill. Llight tan. 60% recovery.
					30				24-28 feet: Wet, light tan, fly ash fill to 26 feet. Clay at 26-28 feet. Collect sample from 24-26 feet.

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-5
Date Drilled (Start/Finish): 2/14/2011
Drilling Method: Geoprobe Boring
Drilling Company: Seagull Environmental Technologies
Elevation: ~400 feet **Total Depth:** 12 feet
Coordinates: 38.20624, -90.39207
Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann
Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Fly ash fill. Light gray and tan. 70% recovery. Collect sample from 0-2 feet.
					10				4-8 feet: Same as above. 90% recovery.
					15				8-12 feet: 8-10.5 feet: Fly ash fill. 10.5-11 feet: Sand. 11-12 feet: Shot rock.

Boring Log Form

Site Name: Rotary Drilling Supply Site **Boring Number:** RDS-SB-6
Date Drilled (Start/Finish): 2/14/2011
Drilling Method: Geoprobe Boring
Drilling Company: Seagull Environmental Technologies
Elevation: ~400 feet **Total Depth:** 16 feet
Coordinates: 38.20701, -90.39195
Depth to Water: NA **Geologist:** Ann Marie Pohlman & Christy Engemann
Project Number: X9004.L.10.0214.000 **Weather:** Sunny, windy, 40s

Sample Interval	Interval	Soil Recv.	Core Recv.	Field Screening	Depth (Feet)	Color (Munsell or Rock)	Lithology	Graphic Log	Description and Remarks
					5				0-4 feet: Fly ash fill. 100% recovery.
					10				4-8 feet: Fly ash fill to 7 feet. Other fill at 7-8 feet. 75% recovery.
					15				8-12 feet: Fly ash and other fill at 10-12 feet. 50% recovery.
									12-16 feet: Fly ash and other fill. Silty sand at 15-16 feet. Collect sample from 13-15 feet.

APPENDIX E

FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-1-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-1

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	9:37
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180	Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14	Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28	Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20079 N
-90.39288 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-2-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-2

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	10:15
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20677 N
-90.39229 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-3-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-3

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/14/11 11:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20671 N
-90.39163 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-4-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-4

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	12:10
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20656 N
-90.39117 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-5-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-5

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	12:45
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20624° N
-90.39207 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-6-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SB-6

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	13:20
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180	Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14	Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28	Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20701 N
-90.39195 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-7-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SF-1

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/14/11 13:39
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 8 oz glass	4 Deg C	28	Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180	Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180	Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14	Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28	Days	1 TCLP Mercury in Soil

Sample Comments:

(N/A)

38.20696 N
-90.39188 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-8-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SF-2

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/14/11 13:50

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:
(N/A)

38.20606 N
-90.39151 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-9-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Soil sample

External Sample Number: RDS-SF-3

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	14:00
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	180 Days	1 TCLP Metals in Soil
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS
1 - 8 oz glass	None	28 Days	1 TCLP Mercury in Soil

Sample Comments:
(N/A)

38.20658 N
-90.39273 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-10-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-2-CAE

Expected Conc: (or Circle One: Low Medium High)

	Date	Time(24 hr)
Latitude: ___ ___ ___ **Sample Collection: Start:** CAE 12/15/11		12:55
Longitude: ___ ___ ___ **End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:
(N/A)

38.20551 N
-90.39093 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 10 **QC Code:** FD **Matrix:** Solid **Tag ID:** 5198-10-FD

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-2nd FD

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	12:55
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:
(N/A)

38.20551 N
-90.39693 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-11-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-~~2~~ 4

		Date	Time(24 hr)
Expected Conc:	(or Circle One: Low Medium High)		
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	13:30
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:
(N/A)

38.20575 N
-90.39108 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-12-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-3 6

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 13:50

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:

(N/A)

38.20550 N
-90.39191 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-13-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-4 CAE

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	14:20
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:

(N/A)

38.20537 N
-90.39525 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-14-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-~~5~~8 CA E

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	14:30
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:
(N/A)

38.20523 N
-90.39478 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-15-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-9

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	14:45
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:

(N/A)

38.20481 N
-90.39478 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-16-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-1

Expected Conc: (or Circle One: Low Medium High)

	Date	Time(24 hr)
Latitude: ___ ___ ___ **Sample Collection: Start:**	2/15/11	4:18
Longitude: ___ ___ ___ **End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS

Sample Comments:

(N/A)

38.20676 N
-90.39066 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-17-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-3

		Date	Time(24 hr)
Expected Conc:	(or Circle One: Low Medium High)		
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	13:10
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS

Sample Comments:
(N/A)

38.20546 N
-90.39116 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 5198-18-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Sediment sample

External Sample Number: RDS-SD-5

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 13:40

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES
1 - 8 oz glass	4 Deg C	14 Days	1 PAH's in Soil by GC/MS

Sample Comments:

(N/A)

38.20556 N
-90.39127

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 30 **QC Code:** PE **Matrix:** Solid **Tag ID:** 5198-30-PE

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: CLP QATS PE SAMPLE: METALS & MERCURY

External Sample Number: _____

Expected Conc: Low (or Circle One: Low Medium High)

Latitude: ___ ___ ___
Longitude: ___ ___ ___

	Date	**Time(24 hr)**
Sample Collection: Start:	01/25/2011	10:00
End:	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	28 Days	1 Mercury in Soil or Sediment
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP-AES

Sample Comments:

QATS ID # MS02470

SAMPLE AND INSTRUCTION SHEETS LEFT IN BACK DOCK REFRIGERATOR TO BE INCLUDED WITH THE FIELD SAMPLES. 12/28/10 RKE

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 101 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-101-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-1

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 11:18

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28 Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS
1 - 128oz amber glass	4 Deg C	7 Days	1 PAH's in Water by GC/MS-SIM

Sample Comments:

(N/A)

38.20676 N
-90.39066 W

And collected MS/MSD

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 102 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-102-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-3

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 13:10

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS
1 - 128oz amber glass	4 Deg C	7	Days	1 PAH's in Water by GC/MS-SIM

Sample Comments:

(N/A)

38.20546 N
-90.39116 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 103 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-103-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-5

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 13:40

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28 Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS
1 - 128oz amber glass	4 Deg C	7 Days	1 PAH's in Water by GC/MS-SIM

Sample Comments:

(N/A)

38.20556 N
-90.39127 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 104 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-104-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-2

		Date	Time(24 hr)
Expected Conc:	(or Circle One: Low Medium High)		
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	12:55
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28 Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A)

38.20551 N
-90.39093 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 104 **QC Code:** FD **Matrix:** Water **Tag ID:** 5198-104-FD

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-2-FD

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 12:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

38.20551 N
-90.39093 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 105 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-105-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-4

		Date	Time(24 hr)
Expected Conc:	(or Circle One: Low Medium High)		
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	13:30
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28 Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

~~38.20556 N~~ C4E

38.20575 N

-90.39108 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 106 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-106-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-6

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	13:50
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A)

38.20550 N
-90.39191 W

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 107 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-107-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-7

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 14:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

38.20537 N
-90.39525 W

Background sample.

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 108 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-108-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-8

		Date	Time(24 hr)
Expected Conc:	(or Circle One: Low Medium High)		
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/15/11	14:30
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A)

38.20523 N
-90.39478 W

Background sample.

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 109 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-109-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Surface water sample

External Sample Number: RDS-SW-9

Expected Conc: (or Circle One: Low Medium High)

	Date	Time(24 hr)
Latitude: ___ ___ ___ **Sample Collection: Start:**	2/15/11	14:45
Longitude: ___ ___ ___ **End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28 Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

38.20481 N
-90.39478 W

Background Sample.

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 111 **QC Code:** __ **Matrix:** Water **Tag ID:** 5198-111-__

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Rinsate sample

External Sample Number: RDS-RB

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	2/14/11	13:18
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A) Rinsate Sample

Sample Collected By: AMP

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5198 **Sample Number:** 112 **QC Code:** FB **Matrix:** Water **Tag ID:** 5198-112-FB

Project ID: JBDA7X900 **Project Manager:** Jamie Bernard-Drakey
Project Desc: Rotary Drilling Supply Inc. - PA sampling
City: Crystal City **State:** Missouri
Program: Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00

Location Desc: Field Blank sample

External Sample Number: RDS-FB

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 2/15/11 15:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time		Analysis
1 - 1 Liter Cubitainer	5 mL of HNO3/L to pH<2	28	Days	1 Mercury in Water
1 - 1 Liter Cubitainer	HNO3 to pH<2	180	Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A)

Sample Collected By: AMP

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Jamie Bernard-Drakey	Rotary Drilling Supply Site		1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: 8oz. jars CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
5193-1	X						X				
-2											
-3											
-4											
-5											
-6											
-7											
-8											
-9											
-10											
-16-FD											
-11											
-12											
-13											
-14											
-15											
-16											
-17											
-18	↓						↓				

2-16-11

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

3 ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

X COMMERCIAL CARRIER: 7967 6914 5440

____ COURIER

____ SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] ☒ SEALED ☐ UNSEALED	2-16-11	1130	☐ SEALED ☐ UNSEALED	
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY, REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Jamie Bernard-Drakey	Rotary Drilling Supply Sill		2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
5198-101	X					X					
-102	↓					↓					Need SIM detection
-103	↓					↓					
-104	↓					↓					limit on all
-104-FD	↓					↓					
-105	↓					↓					Water Samples
-106	↓					↓					
-107	↓					↓					
-108	↓					↓					
-109	↓					↓					
-111	↓					↓					
-112-FB	↓					↓					

2-16-11

DESCRIPTION OF SHIPMENT

___ PIECE(S) CONSISTING OF ___ BOX(ES)

3 ICE CHEST(S): OTHER ___

MODE OF SHIPMENT

X COMMERCIAL CARRIER: 7967 6914 5565 0 7967 6914 5473

___ COURIER

___ SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] X SEALED ☐ UNSEALED	2-16-11	1130	☐ SEALED ☐ UNSEALED	
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

APPENDIX F

ANALYTICAL RESULTS

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date:

Subject: Transmittal of Sample Analysis Results for ASR #: 5198

Project ID: JBDA7X900

Project Description: Rotary Drilling Supply Inc. - PA sampling

From: Michael F. Davis, Chief
Chemical Analysis and Response Branch, Environmental Services Division

To: Jamie Bernard-Drakey
SUPR/ERSB

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Jamie Bernard-Drakey **Org:** SUPR/ERSB **Phone:** 913-551-7400
Project ID: JBDA7X900
Project Desc: Rotary Drilling Supply Inc. - PA sampling
Location: Crystal City **State:** Missouri **Program:** Superfund
Site Name: ROTARY DRILLING SUPPLY INC - SITEWIDE **Site ID:** A7X9 **Site OU:** 00
Purpose: Site Preliminary Assessment **GPRA PRC:** 302DD2C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FB = Field Blank
FD = Field Duplicate

Units: Specific units in which results are reported.

mg/L = Milligrams per Liter
mg/kg = Milligrams per Kilogram
ug/L = Micrograms per Liter
ug/kg = Micrograms per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
U = The analyte was not detected at or above the reporting limit.
UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

ASR Number: 5198 **Sample Information Summary** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1	- __	Solid	RDS-SB-1		02/14/2011	09:37			02/17/2011
2	- __	Solid	RDS-SB-2		02/14/2011	10:15			02/17/2011
3	- __	Solid	RDS-SB-3		02/14/2011	11:05			02/17/2011
4	- __	Solid	RDS-SB-4		02/14/2011	12:10			02/17/2011
5	- __	Solid	RDS-SB-5		02/14/2011	12:45			02/17/2011
6	- __	Solid	RDS-SB-6		02/14/2011	13:20			02/17/2011
7	- __	Solid	RDS-SF-1		02/14/2011	13:39			02/17/2011
8	- __	Solid	RDS-SF-2		02/14/2011	13:50			02/17/2011
9	- __	Solid	RDS-SF-3		02/14/2011	14:00			02/17/2011
10	- __	Solid	RDS-SD-2		02/15/2011	12:55			02/17/2011
10	- FD	Solid	RDS-SD-2FD/Field Duplicate of sample 10		02/15/2011	12:55			02/17/2011
11	- __	Solid	RDS-SD-4		02/15/2011	13:30			02/17/2011
12	- __	Solid	RDS-SD-6		02/15/2011	13:50			02/17/2011
13	- __	Solid	RDS-SD-7		02/15/2011	14:20			02/17/2011
14	- __	Solid	RDS-SD-8		02/15/2011	14:30			02/17/2011
15	- __	Solid	RDS-SD-9		02/15/2011	14:45			02/17/2011
16	- __	Solid	RDS-SD-1		02/15/2011	11:18			02/17/2011
17	- __	Solid	RDS-SD-3		02/15/2011	13:10			02/17/2011
18	- __	Solid	RDS-SD-5		02/15/2011	13:40			02/17/2011
101	- __	Water	RDS-SW-1		02/15/2011	11:18			02/17/2011
102	- __	Water	RDS-SW-3		02/15/2011	13:10			02/17/2011
103	- __	Water	RDS-SW-5		02/15/2011	13:40			02/17/2011
104	- __	Water	RDS-SW-2		02/15/2011	12:55			02/17/2011
104	- FD	Water	RDS-SW-2FD/Field Duplicate of sample 104		02/15/2011	12:55			02/17/2011
105	- __	Water	RDS-SW-4		02/15/2011	13:30			02/17/2011
106	- __	Water	RDS-SW-6		02/15/2011	13:50			02/17/2011
107	- __	Water	RDS-SW-7		02/15/2011	14:20			02/17/2011
108	- __	Water	RDS-SW-8		02/15/2011	14:30			02/17/2011
109	- __	Water	RDS-SW-9		02/15/2011	14:45			02/17/2011
111	- __	Water	Rinsate sample		02/15/2011	13:18			02/17/2011
112	- FB	Water	Field Blank sample		02/15/2011	15:00			02/17/2011

Analysis **Comments About Results For This Analysis**

1 Mercury in Soil or Sediment

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Basis: Dry

Samples:

1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	10-FD	11-__	12-__	13-__
14-__	15-__	16-__	17-__	18-__		

Comments:
Mercury was UJ-coded in samples -1, -3, -4, and -7 through -17 and mercury was J-coded in samples -2, -5, -6, and -18. Positive results were J-coded and non-detect results were UJ-coded due to low recovery of this analyte (Hg: 0.25 mg/Kg vs 0.27-1.1 mg/Kg) in the performance evaluation (PE) sample. The actual reporting limit for this analyte may be higher than the reported value.

1 Metals in Solids by ICP-AES

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Basis: Dry

Samples:

1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	10-FD	11-__	12-__	13-__
14-__	15-__	16-__	17-__	18-__		

Comments:
Slight boron contamination was found in the calibration blanks. Only samples containing this analyte at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: boron in -1.

Cadmium in samples -1, -3 through -5, -8, -9, and -13 through -15 was UJ-coded and cadmium in samples -2, -6, -7, -10, -11, -12, -17, and -18 was J-coded. Positive results within a factor of ten were J-coded and non-detect results were UJ-coded due to negative recoveries of this analyte in the interference check samples (ICS) which was not present in the ICS solution but whose absolute values were greater than the method detection limit (MDL), therefore, a possibility of false negatives exists. The actual reporting limits may be higher than the reported values.

Antimony was UJ-coded in sample -18. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to low recovery of this analyte (Sb: 32% vs 75-125%) in the laboratory matrix spike. The actual reporting limit for this analyte may be higher than the reported value.

Vanadium and zinc were J-coded in sample -18. Although the analytes in question have been positively identified in the sample, the quantitations are an estimate (J-coded) due to

Analysis **Comments About Results For This Analysis**

low recoveries of these analytes (V: 74% and Zn: 74% vs 75-125%) in the laboratory matrix spike. The actual concentrations for these analytes may be higher than the reported values.

Arsenic, barium, boron, chromium, copper, iron, magnesium, manganese, sodium, vanadium, and zinc in sample -18 were J-coded. Although the analytes in question have been positively identified in these samples, the quantitations are an estimate (J-coded) due to the serial dilution percent differences (As: 30.1%, Ba: 17%, B: 25%, Cr: 21%, Cu: 16%, Fe: 24%, Mg: 17%, Mn: 24%, Na: 16%, V: 26%, and Zn: 16%) being above the control limits (15%). The actual concentrations for these analytes may be higher than the reported values.

1 PAH's in Soil by GC/MS

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Basis: Dry

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 16-__ 17-__ 18-__

Comments:
(N/A)

1 TCLP Mercury in Soil

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3121.23B applied to TCLP extracts

Basis: N/A

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:

1 TCLP Metals in Soil

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3122.3D Applied to TCLP extracts

Basis: N/A

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__

Comments:

1 Mercury in Water

Lab: Contract Lab Program (Out-Source)

Analysis	Comments About Results For This Analysis

Method: CLP Statement of Work

Samples: 101-__ 102-__ 103-__ 104-__ 104-FD 105-__ 106-__
107-__ 108-__ 109-__ 111-__ 112-FB

Comments:
(N/A)

1 Metals in Water by ICP/MS

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples: 101-__ 102-__ 103-__ 104-__ 104-FD 105-__ 106-__
107-__ 108-__ 109-__ 111-__ 112-FB

Comments:
Slight arsenic, boron, cobalt, copper, lead, nickel, and zinc contamination were found in the calibration blanks. Only samples containing these analytes at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained these analytes but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limits have been raised to the levels found in the samples. Samples affected were: arsenic in -104, -104FD, and -111, boron in -107, -108, -109, and -111, cobalt in -101, copper in -101, -102, -104, -104FD, -107, -108, -109, and -111, lead in -102, -104, -104FD, -107, -108, and -111, nickel in -103, -106, -107, -108, -109, and -111, and zinc in -102 through -104FD, -106, -108, and -109.

Negative zinc contamination was found in the preparation blank. Only samples containing this analyte at a level greater than five times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than five times the contamination in the blank have the result J-coded. Samples affected were: zinc in -101 and -107.

1 PAH's in Water by GC/MS-SIM

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples: 101-__ 102-__ 103-__

Comments:
Samples -101, -103 and -103 were extracted 1 day past the 7 day extraction holding time. The results for all analytes (no analytes of interest were detected in these samples) were UJ-coded in samples -101, -102 and -103 to indicate that the reporting limit is an estimated value. The actual reporting limit may be higher than the reported value.

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.10 UJ	0.21 J	0.11 UJ	0.16 UJ
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	1270	61300	56300	62000
Antimony	mg/kg	5.2 U	7.0 U	6.3 U	8.3 U
Arsenic	mg/kg	3.8	39.2	17.1	50.4
Barium	mg/kg	17.4 U	4270	3950	4300
Beryllium	mg/kg	0.43 U	3.6	3.0	4.0
Boron	mg/kg	12.3 U	538	406	590
Cadmium	mg/kg	0.43 UJ	0.67 J	0.53 UJ	0.69 UJ
Calcium	mg/kg	108000	123000	111000	118000
Chromium	mg/kg	3.0	51.2	33.7	59.1
Cobalt	mg/kg	4.3 U	18.8	13.5	19.3
Copper	mg/kg	4.9	137	105	142
Iron	mg/kg	2950	25300	22100	24200
Lead	mg/kg	38.7	45.2	19.4	56.3
Magnesium	mg/kg	55100	16200	14800	16600
Manganese	mg/kg	65.5	172	149	223
Nickel	mg/kg	5.7	48.3	33.5	50.7
Potassium	mg/kg	682	1780	1410	2080
Selenium	mg/kg	3.0 U	6.0	3.7 U	5.5
Silver	mg/kg	0.87 U	1.2 U	1.1 U	1.4 U
Sodium	mg/kg	434 U	4730	4980	4900
Thallium	mg/kg	2.2 U	2.9 U	2.6 U	3.4 U
Vanadium	mg/kg	4.6	161	129	167
Zinc	mg/kg	16.6	104	62.5	128
1 PAH's in Soil by GC/MS					
Acenaphthene	ug/kg	190 U	240 U	230 U	280 U
Acenaphthylene	ug/kg	190 U	240 U	230 U	280 U
Anthracene	ug/kg	190 U	240 U	230 U	280 U
Benzo(a)anthracene	ug/kg	190 U	240 U	230 U	280 U
Benzo(a)pyrene	ug/kg	190 U	240 U	230 U	280 U
Benzo(b)fluoranthene	ug/kg	190 U	240 U	230 U	280 U
Benzo(g,h,i)perylene	ug/kg	190 U	240 U	230 U	280 U
Benzo(k)fluoranthene	ug/kg	190 U	240 U	230 U	280 U
2-Chloronaphthalene	ug/kg	190 U	240 U	230 U	280 U
Chrysene	ug/kg	190 U	240 U	230 U	280 U
Dibenz(a,h)anthracene	ug/kg	190 U	240 U	230 U	280 U
Fluoranthene	ug/kg	190 U	240 U	230 U	280 U
Fluorene	ug/kg	190 U	240 U	230 U	280 U
Indeno(1,2,3-cd)pyrene	ug/kg	190 U	240 U	230 U	280 U
2-Methylnaphthalene	ug/kg	190 U	240 U	230 U	280 U
Naphthalene	ug/kg	190 U	240 U	230 U	280 U
Phenanthrene	ug/kg	190 U	240 U	230 U	280 U
Pyrene	ug/kg	190 U	240 U	230 U	280 U

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 TCLP Mercury in Soil					
Mercury	mg/L	0.000200 U	0.000200 U	0.000200 U	0.000200 U
1 TCLP Metals in Soil					
Arsenic	mg/L	0.050 U	0.050 U	0.050 U	0.050 U
Barium	mg/L	0.401	1.41	1.61	1.41
Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Chromium	mg/L	0.015 U	0.0918	0.0742	0.0360
Lead	mg/L	0.050 U	0.050 U	0.050 U	0.050 U
Selenium	mg/L	0.0564	0.0705	0.0756	0.0680
Silver	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.35 J	0.18 J	0.13 UJ	0.12 UJ
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	61100	43000	47200	54800
Antimony	mg/kg	6.9 U	7.0 U	7.6 U	7.2 U
Arsenic	mg/kg	17.8	56.2	18.2	9.8
Barium	mg/kg	4350	2200	3610	3560
Beryllium	mg/kg	3.1	3.9	2.3	2.8
Boron	mg/kg	446	424	423	269
Cadmium	mg/kg	0.58 UJ	0.89 J	0.69 J	0.60 UJ
Calcium	mg/kg	126000	75400	97200	109000
Chromium	mg/kg	39.1	47.9	51.7	27.4
Cobalt	mg/kg	16.7	15.2	12.5	13.6
Copper	mg/kg	122	94.4	117	84.9
Iron	mg/kg	25000	21800	18600	25500
Lead	mg/kg	22.4	58.9	27.9	10.0
Magnesium	mg/kg	17800	10500	13700	14500
Manganese	mg/kg	150	197	125	143
Nickel	mg/kg	41.9	44.8	30.2	34.7
Potassium	mg/kg	1350	2220	1500	1530
Selenium	mg/kg	4.0 U	5.1	4.5 U	4.2 U
Silver	mg/kg	1.2 U	1.2 U	1.3 U	1.2 U
Sodium	mg/kg	4830	3390	5140	4740
Thallium	mg/kg	2.9 U	2.9 U	3.2 U	3.0 U
Vanadium	mg/kg	143	132	121	119
Zinc	mg/kg	73.3	137	80.7	52.8
1 PAH's in Soil by GC/MS					
Acenaphthene	ug/kg	240 U	240 U	260 U	240 U
Acenaphthylene	ug/kg	240 U	240 U	260 U	240 U
Anthracene	ug/kg	240 U	240 U	260 U	240 U
Benzo(a)anthracene	ug/kg	240 U	240 U	260 U	240 U
Benzo(a)pyrene	ug/kg	240 U	240 U	260 U	240 U
Benzo(b)fluoranthene	ug/kg	240 U	240 U	260 U	240 U
Benzo(g,h,i)perylene	ug/kg	240 U	240 U	260 U	240 U
Benzo(k)fluoranthene	ug/kg	240 U	240 U	260 U	240 U
2-Chloronaphthalene	ug/kg	240 U	240 U	260 U	240 U
Chrysene	ug/kg	240 U	240 U	260 U	240 U
Dibenz(a,h)anthracene	ug/kg	240 U	240 U	260 U	240 U
Fluoranthene	ug/kg	240 U	240 U	260 U	240 U
Fluorene	ug/kg	240 U	240 U	260 U	240 U
Indeno(1,2,3-cd)pyrene	ug/kg	240 U	240 U	260 U	240 U
2-Methylnaphthalene	ug/kg	240 U	240 U	260 U	240 U
Naphthalene	ug/kg	240 U	240 U	260 U	240 U
Phenanthrene	ug/kg	240 U	240 U	260 U	240 U
Pyrene	ug/kg	240 U	240 U	260 U	240 U

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 TCLP Mercury in Soil					
Mercury	mg/L	0.000200 U	0.000200 U	0.000200 U	0.000200 U
1 TCLP Metals in Soil					
Arsenic	mg/L	0.050 U	0.050 U	0.050 U	0.050 U
Barium	mg/L	1.50	1.66	0.714	2.04
Cadmium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U
Chromium	mg/L	0.0753	0.0770	0.0313	0.0268
Lead	mg/L	0.050 U	0.050 U	0.050 U	0.050 U
Selenium	mg/L	0.0729	0.0793	0.0552	0.0565
Silver	mg/L	0.025 U	0.025 U	0.025 U	0.025 U

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	9-__	10-__	10-FD	11-__
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.11 UJ	0.18 UJ	0.20 UJ	0.19 UJ
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	54000	31000	15900	44700
Antimony	mg/kg	6.1 U	5.3 U	5.5 U	5.3 U
Arsenic	mg/kg	8.9	20.0	11.4	26.8
Barium	mg/kg	3600	2100	780	3050
Beryllium	mg/kg	2.6	1.7	1.1	2.5
Boron	mg/kg	275	90.9	53.5	193
Cadmium	mg/kg	0.51 UJ	0.79 J	2.2	0.77 J
Calcium	mg/kg	112000	173000	55000	127000
Chromium	mg/kg	22.1	29.4	19.3	46.1
Cobalt	mg/kg	13.8	12.8	20.3	14.3
Copper	mg/kg	75.4	88.2	96.5	103
Iron	mg/kg	24800	15800	16500	18400
Lead	mg/kg	9.0	124	637	62.4
Magnesium	mg/kg	17200	15900	14600	18100
Manganese	mg/kg	138	1510	866	547
Nickel	mg/kg	33.0	27.9	31.3	35.5
Potassium	mg/kg	1300	1250	1110	2040
Selenium	mg/kg	3.5 U	16.5	7.1	9.7
Silver	mg/kg	1.0 U	0.89 U	0.91 U	0.88 U
Sodium	mg/kg	5310	2770	1140	5350
Thallium	mg/kg	2.5 U	2.2 U	2.3 U	2.2 U
Vanadium	mg/kg	108	76.6	47.1	93.9
Zinc	mg/kg	43.0	106	197	117
1 PAH's in Soil by GC/MS					
Acenaphthene	ug/kg	190 U			
Acenaphthylene	ug/kg	190 U			
Anthracene	ug/kg	190 U			
Benzo(a)anthracene	ug/kg	190 U			
Benzo(a)pyrene	ug/kg	190 U			
Benzo(b)fluoranthene	ug/kg	190 U			
Benzo(g,h,i)perylene	ug/kg	190 U			
Benzo(k)fluoranthene	ug/kg	190 U			
2-Chloronaphthalene	ug/kg	190 U			
Chrysene	ug/kg	190 U			
Dibenz(a,h)anthracene	ug/kg	190 U			
Fluoranthene	ug/kg	190 U			
Fluorene	ug/kg	190 U			
Indeno(1,2,3-cd)pyrene	ug/kg	190 U			
2-Methylnaphthalene	ug/kg	190 U			
Naphthalene	ug/kg	190 U			
Phenanthrene	ug/kg	190 U			
Pyrene	ug/kg	190 U			

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	9-__	10-__	10-FD	11-__
1 TCLP Mercury in Soil					
Mercury	mg/L	0.000200 U			
1 TCLP Metals in Soil					
Arsenic	mg/L	0.050 U			
Barium	mg/L	4.98			
Cadmium	mg/L	0.005 U			
Chromium	mg/L	0.050 U			
Lead	mg/L	0.050 U			
Selenium	mg/L	0.050 U			
Silver	mg/L	0.025 U			

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	12-__	13-__	14-__	15-__
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.18 UJ	0.13 UJ	0.18 UJ	0.13 UJ
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	11300	7070	6970	4310
Antimony	mg/kg	5.3 U	7.1 U	5.1 U	7.8 U
Arsenic	mg/kg	8.1	3.7	3.1	4.3
Barium	mg/kg	491	65.0	87.2	69.8
Beryllium	mg/kg	0.75	0.60 U	0.50	0.65 U
Boron	mg/kg	28.8	11.9 U	8.6 U	13.0 U
Cadmium	mg/kg	1.0 J	0.60 UJ	0.43 UJ	0.65 UJ
Calcium	mg/kg	90400	1380	2330	75800
Chromium	mg/kg	18.7	10.5	10.7	8.7
Cobalt	mg/kg	7.5	7.1	4.6	6.5 U
Copper	mg/kg	48.8	10.8	33.3	12.2
Iron	mg/kg	15000	10300	8670	9130
Lead	mg/kg	107	12.7	28.7	14.9
Magnesium	mg/kg	10900	1360	1660	3170
Manganese	mg/kg	768	142	140	265
Nickel	mg/kg	17.1	9.2	10.0	9.9
Potassium	mg/kg	1050	693	767	649 U
Selenium	mg/kg	3.1 U	4.2 U	3.0 U	4.5 U
Silver	mg/kg	0.88 U	1.2 U	0.86 U	1.3 U
Sodium	mg/kg	857	595 U	428 U	649 U
Thallium	mg/kg	2.2 U	3.0 U	2.1 U	3.2 U
Vanadium	mg/kg	30.8	23.2	21.2	15.0
Zinc	mg/kg	204	33.9	50.1	46.4

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	16-__	17-__	18-__	101-__
1 Mercury in Soil or Sediment					
Mercury	mg/kg	0.18 UJ	0.18 UJ	0.19 J	
1 Metals in Solids by ICP-AES					
Aluminum	mg/kg	6270	7670	31200	
Antimony	mg/kg	5.1 U	8.0 U	4.9 UJ	
Arsenic	mg/kg	5.3	6.3	12.4 J	
Barium	mg/kg	98.9	719	1310 J	
Beryllium	mg/kg	0.75	0.67 U	1.5	
Boron	mg/kg	8.4 U	23.7	57.9 J	
Cadmium	mg/kg	2.0	0.68 J	0.86 J	
Calcium	mg/kg	14200	205000	103000	
Chromium	mg/kg	11.6	14.5	30.5 J	
Cobalt	mg/kg	16.3	7.6	10.8	
Copper	mg/kg	59.1	69.0	65.1 J	
Iron	mg/kg	13600	8480	17400 J	
Lead	mg/kg	587	239	83.2	
Magnesium	mg/kg	6300	11700	14300 J	
Manganese	mg/kg	792	739	1230 J	
Nickel	mg/kg	20.4	13.1	26.8	
Potassium	mg/kg	546	667 U	1180	
Selenium	mg/kg	3.0 U	4.7 U	2.9 U	
Silver	mg/kg	0.84 U	1.3 U	0.82 U	
Sodium	mg/kg	422 U	667 U	1850 J	
Thallium	mg/kg	2.1 U	3.3 U	2.1 U	
Vanadium	mg/kg	19.7	18.2	59.5 J	
Zinc	mg/kg	183	99.0	156 J	
1 PAH's in Soil by GC/MS					
Acenaphthene	ug/kg	340 U	290 U	380 U	
Acenaphthylene	ug/kg	340 U	290 U	380 U	
Anthracene	ug/kg	340 U	290 U	380 U	
Benzo(a)anthracene	ug/kg	340 U	290 U	380 U	
Benzo(a)pyrene	ug/kg	340 U	290 U	380 U	
Benzo(b)fluoranthene	ug/kg	340 U	290 U	380 U	
Benzo(g,h,i)perylene	ug/kg	340 U	290 U	380 U	
Benzo(k)fluoranthene	ug/kg	340 U	290 U	380 U	
2-Chloronaphthalene	ug/kg	340 U	290 U	380 U	
Chrysene	ug/kg	340 U	290 U	380 U	
Dibenz(a,h)anthracene	ug/kg	340 U	290 U	380 U	
Fluoranthene	ug/kg	340 U	290 U	380 U	
Fluorene	ug/kg	340 U	290 U	380 U	
Indeno(1,2,3-cd)pyrene	ug/kg	340 U	290 U	380 U	
2-Methylnaphthalene	ug/kg	340 U	290 U	380 U	
Naphthalene	ug/kg	340 U	290 U	380 U	
Phenanthrene	ug/kg	340 U	290 U	380 U	
Pyrene	ug/kg	340 U	290 U	380 U	

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	16-__	17-__	18-__	101-__
1 Mercury in Water					
Mercury	ug/L				0.20 U
1 Metals in Water by ICP/MS					
Antimony	ug/L				2.0 U
Arsenic	ug/L				1.0 U
Barium	ug/L				108
Beryllium	ug/L				1.0 U
Boron	ug/L				293
Cadmium	ug/L				1.0 U
Chromium	ug/L				2.0 U
Cobalt	ug/L				1.5 U
Copper	ug/L				2.1 U
Lead	ug/L				9.9
Manganese	ug/L				641
Nickel	ug/L				3.6
Selenium	ug/L				5.0 U
Silver	ug/L				1.0 U
Thallium	ug/L				1.0 U
Vanadium	ug/L				5.0 U
Zinc	ug/L				6.2 J
1 PAH's in Water by GC/MS-SIM					
Acenaphthene	ug/L				0.050 UJ
Acenaphthylene	ug/L				0.050 UJ
Anthracene	ug/L				0.050 UJ
Benzo(a)anthracene	ug/L				0.050 UJ
Benzo(a)pyrene	ug/L				0.050 UJ
Benzo(b)fluoranthene	ug/L				0.050 UJ
Benzo(g,h,i)perylene	ug/L				0.050 UJ
Benzo(k)fluoranthene	ug/L				0.050 UJ
Chrysene	ug/L				0.050 UJ
Dibenz(a,h)anthracene	ug/L				0.050 UJ
Fluoranthene	ug/L				0.050 UJ
Fluorene	ug/L				0.050 UJ
Indeno(1,2,3-cd)pyrene	ug/L				0.050 UJ
1-Methylnaphthalene	ug/L				0.050 UJ
2-Methylnaphthalene	ug/L				0.050 UJ
Naphthalene	ug/L				0.050 UJ
Phenanthrene	ug/L				0.050 UJ
Pyrene	ug/L				0.050 UJ

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	102-__	103-__	104-__	104-FD
1 Mercury in Water					
Mercury	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
1 Metals in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	4.0	1.0 U	3.8 U	3.7 U
Barium	ug/L	151	103	148	140
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Boron	ug/L	664	156	651	618
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Cobalt	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Copper	ug/L	2.9 U	2.0 U	2.7 U	2.6 U
Lead	ug/L	2.0 U	1.0 U	2.4 U	2.6 U
Manganese	ug/L	222	212	282	267
Nickel	ug/L	3.4	2.2 U	3.8	3.6
Selenium	ug/L	7.5	5.0 U	7.0	7.4
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Zinc	ug/L	2.3 U	2.7 U	3.9 U	3.5 U
1 PAH's in Water by GC/MS-SIM					
Acenaphthene	ug/L	0.050 UJ	0.050 UJ		
Acenaphthylene	ug/L	0.050 UJ	0.050 UJ		
Anthracene	ug/L	0.050 UJ	0.050 UJ		
Benzo(a)anthracene	ug/L	0.050 UJ	0.050 UJ		
Benzo(a)pyrene	ug/L	0.050 UJ	0.050 UJ		
Benzo(b)fluoranthene	ug/L	0.050 UJ	0.050 UJ		
Benzo(g,h,i)perylene	ug/L	0.050 UJ	0.050 UJ		
Benzo(k)fluoranthene	ug/L	0.050 UJ	0.050 UJ		
Chrysene	ug/L	0.050 UJ	0.050 UJ		
Dibenz(a,h)anthracene	ug/L	0.050 UJ	0.050 UJ		
Fluoranthene	ug/L	0.050 UJ	0.050 UJ		
Fluorene	ug/L	0.050 UJ	0.050 UJ		
Indeno(1,2,3-cd)pyrene	ug/L	0.050 UJ	0.050 UJ		
1-Methylnaphthalene	ug/L	0.050 UJ	0.050 UJ		
2-Methylnaphthalene	ug/L	0.050 UJ	0.050 UJ		
Naphthalene	ug/L	0.050 UJ	0.050 UJ		
Phenanthrene	ug/L	0.050 UJ	0.050 UJ		
Pyrene	ug/L	0.050 UJ	0.050 UJ		

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	105-__	106-__	107-__	108-__
1 Mercury in Water					
Mercury	ug/L	0.20 U	0.20 U	0.20 U	0.20 U
1 Metals in Water by ICP/MS					
Antimony	ug/L	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	29.7	1.0 U	1.0 U	1.0 U
Barium	ug/L	309	95.0	54.7	47.9
Beryllium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Boron	ug/L	4040	119	50.2 U	42.7 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	ug/L	15.0	2.0 U	2.0 U	2.0 U
Cobalt	ug/L	3.4	1.0 U	1.0 U	1.0 U
Copper	ug/L	23.8	2.0 U	3.1 U	2.2 U
Lead	ug/L	31.1	1.0 U	2.6 U	1.1 U
Manganese	ug/L	421	63.3	88.5	47.5
Nickel	ug/L	14.5	1.7 U	2.4 U	1.8 U
Selenium	ug/L	25.7	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	51.0	5.0 U	5.0 U	5.0 U
Zinc	ug/L	48.3	2.7 U	7.7 J	3.6 U

ASR Number: 5198 **RLAB Approved Sample Analysis Results** **03/17/2011**

Project ID: JBDA7X900 **Project Desc:** Rotary Drilling Supply Inc. - PA sampling

Analysis/ Analyte	Units	109-__	111-__	112-FB
1 Mercury in Water				
Mercury	ug/L	0.20 U	0.20 U	0.20 U
1 Metals in Water by ICP/MS				
Antimony	ug/L	2.0 U	2.0 U	2.0 U
Arsenic	ug/L	1.0 U	1.4 U	1.0 U
Barium	ug/L	48.8	139	10.0 U
Beryllium	ug/L	1.0 U	1.0 U	1.0 U
Boron	ug/L	38.3 U	33.0 U	10.0 U
Cadmium	ug/L	1.0 U	1.0 U	1.0 U
Chromium	ug/L	2.0 U	9.7	2.0 U
Cobalt	ug/L	1.0 U	1.0 U	1.0 U
Copper	ug/L	2.1 U	6.9 U	2.0 U
Lead	ug/L	1.0 U	1.5 U	1.0 U
Manganese	ug/L	47.9	12.0	1.0 U
Nickel	ug/L	2.3 U	2.4 U	1.0 U
Selenium	ug/L	5.0 U	5.0 U	5.0 U
Silver	ug/L	1.0 U	1.0 U	1.0 U
Thallium	ug/L	1.0 U	1.0 U	1.0 U
Vanadium	ug/L	5.0 U	5.0 U	5.0 U
Zinc	ug/L	3.3 U	19.2	2.0 U

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 5198
Project ID: JBDA7X900
Project Description: Rotary Drilling Supply Inc. - PA sampling

From: Jamie Bernard-Drakey
SUPR/ERSB

To: Kaye Dollmann
ENSV/CARB

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

I understand all samples will be disposed upon receipt of this form, unless samples are requested to be held. If I do not return this form all samples will be disposed of on _____.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account. All Samples may be disposed of upon receipt of this form if not requested to be held.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only. All Samples may be disposed of upon receipt of this form if not requested to be held.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory. All samples may be disposed of upon receipt of the form if not requested to be held.

☐ Hold Samples - I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations.
The reason for the hold is:

☐ Samples are associated with a legal proceeding.

☐ Question/Concern with data - possible reanalysis requested.

☐ Other:_____

APPENDIX G

TABLES

TABLE G-1

METALS ANALYTICAL DATA SUMMARY FOR SURFACE AND SUBSURFACE SOURCE SAMPLES
RDS SITE
FEBRUARY 2011

Aluminum	NE	NE	990,000	77,000	21,700	1,270								
Antimony	31	NE	410	31	NA	5.2 U	7.0 U	6.3 U	8.3 U	6.9 U	7.0 U	7.6 U	7.2 U	6.1 U
Arsenic	23	0.43	1.6	0.39	6.292	**3.8**								
Barium	5,500	NE	190,000	15,000	NA	17.4 U	4,270	3,950	4,300	4,350	2,200	3,610	3,560	3,600
Beryllium	160	NE	2,000	160	NA	0.43 U	3.6	3.0	4.0	3.1	3.9	2.3	2.8	2.6
Boron	7,000	NE	200,000	16,000	NA	12.3 U	538	406	590	446	424	423	269	275
Cadmium	39	NE	800	70	NA	0.43 UJ	0.67 J	0.53 UJ	0.69 UJ	0.58 UJ	0.89 J	0.69 J	0.60 UJ	0.51 UJ
Calcium	NE	NE	NE	NE	25,060									
Chromium	230	NE	NE	NE	NA	3.0	51.2	33.7	59.1	39.1	47.9	51.7	27.4	22.1
Cobalt	NE	NE	300	23	NA	4.3 U	18.8	13.5	19.3	16.7	15.2	12.5	13.6	13.8
Copper	NE	NE	41,000	3,100	13.924	4.9								
Iron	NE	NE	720,000	55,000	14,020	2,950								
Lead	NE	NE	800	400	71.937	38.7	45.2	19.4	56.3	22.4	58.9	27.9	10.0	9.0
Magnesium	NE	NE	NE	NE	10,950						10,500			
Manganese	11,000	NE	23,000	1,800	910.551	65.5	172	149	223	150	197	125	143	138
Mercury	23	NE	43	10	0.018	0.10 UJ		0.11 UJ	0.16 UJ			0.13 UJ	0.12 UJ	0.11 UJ
Nickel	1,600	NE	NE	NE	NA	5.7	48.3	33.5	50.7	41.9	44.8	30.2	34.7	33.0
Potassium	NE	NE	NE	NE	NA	682	1,780	1,410	2,080	1,350	2,220	1,500	1,530	1,300
Selenium	390	NE	5,100	390	0.227	3.0 U		3.7 U		4.0 U		4.5 U	4.2 U	3.5 U
Silver	390	NE	5,100	390	NA	0.87 U	1.2 U	1.1 U	1.4 U	1.2 U	1.2 U	1.3 U	1.2 U	1.0 U
Sodium	NE	NE	NE	NE	2,250	434 U								
Thallium	NE	NE	NE	NE	NA	2.2 U	2.9 U	2.6 U	3.4 U	2.9 U	2.9 U	3.2 U	3.0 U	2.5 U
Vanadium	550	NE	5,200	390	NA	4.6	161	129	167	143	132	121	119	108
Zinc	23,000	NE	310,000	23,000	111.795	16.6	104	62.5		73.3		80.7	52.8	43.0

Notes:

Bold value indicates a concentration exceeds a benchmark value.
Shaded cell indicates a concentration that exceeds the county average for the analyte.

CR	Cancer Risk Screening Concentration from SCDM
ft bgs	Feet below ground surface
J	Estimated concentration
mg/kg	Milligrams per kilogram
NA	Not available
NE	Not established
RDS	Rotary Drilling Supply
RfD	Reference Dose Screening Concentration from SCDM
RSL	Regional screening level (EPA 2010)
SCDM	Superfund Chemical Data Matrix (EPA 2004)
SB	Soil Boring
U	The analyte was not detected at or above the reporting limit
UJ	The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.
USGS	United States Geological Survey (USGS 2010)

TABLE G-2

TCLP METALS SUMMARY FOR SURFACE AND SUBSURFACE SOURCE SAMPLES
RDS SITE
FEBRUARY 2011

Arsenic	7440-38-2	5.0	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Barium	7440-39-3	100.0	0.401	1.41	1.61	1.41	1.50	1.66	0.714	2.04	4.98
Cadmium	7440-43-9	1.0	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chromium	7440-47-3	5.0	0.015 U	0.0918	0.0742	0.0360	0.0753	0.0770	0.0313	0.0268	0.050 U
Lead	7439-92-1	5.0	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Mercury	7439-97-6	0.2	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U	0.000200 U
Selenium	7782-49-2	1.0	0.0564	0.0705	0.0756	0.0680	0.0729	0.0793	0.0552	0.0565	0.050 U
Silver	7440-22-4	5.0	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U

Notes:

CAS No. Chemical Abstracts Service number
ID Identification
mg/L Milligrams per Liter
TCLP Toxicity Characteristic Leaching Procedure
U The analyte was not detected at or above the reporting limit
RDS Rotary Drilling Supply

TABLE G-3

METALS DATA SUMMARY FOR SURFACE WATER SAMPLES
RDS SITE
FEBRUARY 2011

Antimony	NE	NE	> 2.0	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Arsenic	340	150	> 1.0	1.0 U	3.8 U	3.7 U			1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Barium	NE	NE	164.1	108	148	140	151		103	95.0	54.7	47.9	48.8
Beryllium	NE	NE	> 1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Boron	NE	NE	> 50.2								50.2 U	42.7 U	38.3 U
Cadmium	2.0	0.25	> 1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chromium	NE	NE	> 2.0	2.0 U	2.0 U	2.0 U	2.0 U		2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Cobalt	NE	NE	> 1.0	1.5 U	1.0 U	1.0 U	1.0 U		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Copper	13	9.0	> 3.1	2.1 U	2.7 U	2.6 U	2.9 U		2.0 U	2.0 U	3.1 U	2.2 U	2.1 U
Lead	65	2.5	>2.6		2.4 U	2.6 U	2.0 U		1.0 U	1.0 U	2.6 U	1.1 U	1.0 U
Manganese	NE	NE	265.5				222		212	63.3	88.5	47.5	47.9
Mercury	1.4	0.77	> 0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Nickel	470	52	> 2.4						2.2 U	1.7 U	2.4 U	1.8 U	2.3 U
Selenium	NE	5.0	> 5.0	5.0 U					5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	3.2	NE	> 1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Thallium	NE	NE	> 1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vanadium	NE	NE	> 5.0	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Zinc	120	120	23.1	6.2 J	3.9 U	3.5 U	2.3 U		2.7 U	2.7 U	7.7 J	3.6 U	3.3 U

Notes:

Bold value indicates a concentration exceeds a benchmark value.

Shaded value indicates concentration exceeds three times the highest background level or detection limit if not detected in background.

CCC	Criterion Continuous Concentration from SCDM
CMC	Critical Maximum Concentration from SCDM
EPA	U.S. Environmental Protection Agency
FD	Field duplicate
ID	Identification
J	Estimated concentration
µg/L	Micrograms per liter
NE	Not established
RDS	Rotary Drilling Supply
SCDM	Superfund Chemical Data Matrix (EPA 2004)
SW	Surface water
U	The analyte was not detected at or above the reporting limit

TABLE G-4

METALS DATA SUMMARY FOR SEDIMENT SAMPLES
RDS SITE
FEBRUARY 2011

Aluminum	21,210	6,270		15,900	7,670			11,300	7,070	6,970	4,310
Antimony	> 7.8	5.1 U	5.3 U	5.5 U	8.0 U	5.3 U	4.9 UJ	5.3 U	7.1 U	5.1 U	7.8 U
Arsenic	12.9	5.3		11.4	6.3		12.4 J	8.1	3.7	3.1	4.3
Barium	261.6	98.9							65.0	87.2	69.8
Beryllium	1.50	0.75		1.1	0.67 U			0.75	0.60 U	0.50	0.65 U
Boron	> 13.0	8.4 U							11.9 U	8.6 U	13.0 U
Cadmium	> 0.65								0.60 UJ	0.43 UJ	0.65 UJ
Calcium	227,400	14,200	173,000	55,000	205,000	127,000	103,000	90,400	1,380	2,330	75,800
Chromium	32.1	11.6	29.4	19.3	14.5		30.5 J	18.7	10.5	10.7	8.7
Cobalt	21.3	16.3	12.8	20.3	7.6	14.3	10.8	7.5	7.1	4.6	6.5 U
Copper	99.9	59.1	88.2	96.5	69.0		65.1	48.8	10.8	33.3	12.2
Iron	30,900	13,600	15,800	16,500	8,480	18,400	17,400 J	15,000	10,300	8,670	9,130
Lead	86.1					62.4	83.2		12.7	28.7	14.9
Magnesium	9,510	6,300							1,360	1,660	3,170
Manganese	795	792			739	547		768	142	140	265
Mercury	> 0.18	0.18 UJ	0.18 UJ	0.20 UJ	0.18 UJ	0.19 UJ		0.18 UJ	0.13 UJ	0.18 UJ	0.13 UJ
Nickel	30.0	20.4	27.9		13.1		26.8	17.1	9.2	10.0	9.9
Potassium	2,301	546	1,250	1,110	667 U	2,040	1,180	1,050	693	767	649 U
Selenium	> 4.5	3.0 U			4.7 U		2.9 U	3.1 U	4.2 U	3.0 U	4.5 U
Silver	> 1.3	0.84 U	0.89 U	0.91 U	1.3 U	0.88 U	0.82 U	0.88 U	1.2 U	0.86 U	1.3 U
Sodium	> 649	422 U			667 U				595 U	428 U	649 U
Thallium	> 3.2	2.1 U	2.2 U	2.3 U	3.3 U	2.2 U	2.1 U	2.2 U	3.0 U	2.1 U	3.2 U
Vanadium	69.6	19.7		47.1	18.2		59.5 J	30.8	23.2	21.2	15.0
Zinc	150.3		106		99.0	117			33.9	50.1	46.4

Notes:

Shaded value indicates concentration exceeds three times the highest background level or detection limit if not detected in background.

EPA	U.S. Environmental Protection Agency	RDS	Rotary Drilling Supply
FD	Field duplicate	SD	Sediment sample
ID	Identification	U	The analyte was not detected at or above the reporting limit
J	Estimated concentration	UJ	The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

APPENDIX H

REMOVAL SITE EVALUATION FORM

SUPERFUND REMOVAL SITE EVALUATION

I. **SITE NAME AND LOCATION:**		
NAME: Rotary Drilling Supply, Inc.		
ADDRESS OR OTHER LOCATION IDENTIFIER: 1150 South Truman Boulevard		
CITY: Crystal City	**STATE:** Missouri	**ZIP:** 63019
DIRECTIONS TO SITE: From Interstate 55 (I-55) south of St. Louis, go north on Highway 61/67 approximately 1 mile. The site will be on the right (east) side of the highway.		
MAP ATTACHED: See Figure 1 with Removal Site Evaluation/Preliminary Assessment Report		
II. **PROGRAM CONTACTS:**		
REQUESTED BY: Jamie Bernard-Drakey	**DATE OF REQUEST:** 11/08/2010	
AGENCY/OFFICE: U.S. EPA Region 7		
MAILING ADDRESS: 901 N. 5th Street		
CITY: Kansas City	**STATE:** Kansas	**ZIP:** 66101
TELEPHONE: (913) 551-7400	**FAX:** (913) 551-9400	
EVALUATOR: Ann Marie Pohlman		
AGENCY/OFFICE: Tetra Tech EM Inc		
MAILING ADDRESS: 415 Oak Street		
CITY: Kansas City	**STATE:** Missouri	**ZIP:** 64106
TELEPHONE: (816) 412-1741	**FAX:** (816) 410-1748	

III. **REMOVAL SITE EVALUATION CRITERIA [40 CFR 300.410(E)]**

IS THERE A RELEASE AS DEFINED BY THE NCP: **YES** ☒ **or NO** ☐

EXPLAIN: Metals have been detected in fill materials and nearby surface water and sediment samples at concentrations above three times background levels.

*(A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release.)*

IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP: **YES** ☒ **or NO** ☐

EXPLAIN: The site is considered a facility as defined by the NCP.

*(A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel. A **VESSEL** is defined as any description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel.)*

SUPERFUND REMOVAL SITE EVALUATION

DOES THE RELEASE INVOLVE A HAZARDOUS SUBSTANCE, OR POLLUTANT OR CONTAMINANT AS DEFINED BY THE NCP: **YES ☒ or NO ☐**

EXPLAIN: Elevated concentrations of metals were identified in surface water, sediment, and surface and subsurface fill materials at the site.

*(A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the CWA, CERCLA, SDWA, CAA or TSCA. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas. The definition of **POLLUTANT or CONTAMINANT** includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas).*

IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE: **YES ☐ or NO ☒**

EXPLAIN: There are no limitations on response.

*(The **LIMITATIONS ON RESPONSE** provisions of the NCP (40 CFR 300.400(B) states that removals shall not be undertaken in response to a release: of a naturally occurring substance in its unaltered or natural form; from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.)*

DOES THE QUANTITY OR CONCENTRATION WARRANT RESPONSE: **YES ☒ or NO ☐**

EXPLAIN: Coal fly ash used as fill material and contaminated surface water and sediment at/near the site present possible sources of exposure to hazardous substances. Analytical results should be evaluated by EPA risk assessors to determine whether the levels and extent of contamination present an unacceptable risk to human health and the environment that warrants further CERCLA response.

HAS A PRP BEEN IDENTIFIED: **YES ☒ or NO ☐**

EXPLAIN: Rotary Drilling Supply, Inc. (address of facility below) has been identified as the PRP.

Rotary Drilling Supply, Inc.
1150 South Truman Boulevard
Crystal City, MO 63019

IV. CONDITIONS TO WARRANT REMOVAL [40 CFR 300.415(B)(2)]:

ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: **YES ☒ or NO ☐**

EXPLAIN: The potential exists for exposure to elevated levels of metals in surface fill materials at the site and in nearby surface water and sediment.

ACTUAL OR POTENTIAL CONTAMINATION OF DRINKING WATER SUPPLIES: **YES ☐ or NO ☒**

EXPLAIN: Drinking water in the area is provided by the City of Crystal City. The closest known private well is over ½ mile east of the site; therefore, contamination of drinking water is unlikely.

HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS,OR BULK STORAGE CONTAINERS: **YES ☐ or NO ☒**

EXPLAIN: No drums, barrels, or bulk storage containers are present.

SUPERFUND REMOVAL SITE EVALUATION

HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS: YES ☒ or NO ☐

EXPLAIN: Elevated levels of metals have been detected in near-surface fill material at the site.

CONDITIONS SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS: YES ☒ or NO ☐

EXPLAIN: Heavy rainfall could promote contaminated runoff from the coal fly ash fill material.

THREAT OF FIRE OR EXPLOSION: YES ☐ or NO ☒

EXPLAIN: No threat of fire or explosion exists at the site.

POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS: YES ☐ or NO ☒

EXPLAIN: It is not anticipated that other federal or state agencies would be involved with removal activities at the site.

OTHER SITUATIONS OR FACTORS WHICH POSE A THREAT: YES ☐ or NO ☒

EXPLAIN: No other situations or factors exist that could pose a threat.

V. **POTENTIAL REMOVAL ACTIONS [40 CFR 300.415(D)]:**

(NOTE: The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.)

SITE SECURITY: YES ☒ or NO ☐

EXPLAIN: The site is not fenced. Fencing may protect the general public from areas of contamination.

STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: YES ☐ or NO ☒

EXPLAIN: No surface impoundments exist at the site.

CAPPING OF CONTAMINATED SOIL: YES ☒ or NO ☐

EXPLAIN: Surface fill material containing elevated levels of metals has been identified at the site. Capping the material would minimize the threat of exposure.

USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION: YES ☐ or NO ☒

EXPLAIN: Chemical stabilization would not likely be used to control the spread of contamination at the Rotary Drilling Supply site.

CONTAMINATED SOIL EXCAVATION: YES ☒ or NO ☐

EXPLAIN: The coal fly ash fill material could be removed by excavation.

REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS: YES ☐ or NO ☒

EXPLAIN: No drums, tanks, or bulk storage containers are present at the coal fly ash fill site.

CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS,OR CONTAMINANTS: YES ☒ or NO ☐

EXPLAIN: Containment, treatment, or disposal of contaminated fill at the site may be required.

PROVIDE ALTERNATIVE WATER SUPPLIES: YES ☐ or NO ☒

EXPLAIN: Since the City of Crystal City provides drinking water to the Rotary Drilling Supply site, it is not necessary to provide alternative water supplies. No nearby private wells suspected to be contaminated.

SUPERFUND REMOVAL SITE EVALUATION

VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:

	REMOVAL NOT WARRANTED—REMOVAL SITE EVALUATION TERMINATED

(Cite one or more of the criteria from SECTION III. REMOVAL SITE EVALUATION CRITERIA, as the basis for the above determination.)

		NOT A RELEASE			NOT A FACILITY OR VESSEL
		NOT A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT			SUBJECT TO RESPONSE LIMITATIONS
		INSUFFICIENT QUANTITY OR CONCENTRATION			WILLING/CAPABLE PRP IDENTIFIED

COMMENT:

	REMOVAL RECOMMENDED [__ EMERGENCY __ TIME-CRITICAL ___ NON-TIME-CRITICAL]

(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommend that a removal action be conducted.)

		EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS			ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER		FIRE/EXPLOSION THREAT	CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS		NO OTHER RESPONSE MECHANISM	OTHER FACTORS

(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which are recommended.)

		SITE SECURITY		DRAINAGE CONTROL	IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.		SOIL CAPPING	SOIL EXCAVATION
		CONTAIN/TREAT/DISPOSE OF WASTES		CHEMICAL CONTROLS	ALT. DRINKING WATER SUPPLIES

COMMENT:

X	**ADDITIONAL REMOVAL SITE EVALUATION RECOMMENDED**

(Cite one or more of the conditions or factors from Section IV. CONDITIONS TO WARRANT A REMOVAL ACTION, as a basis for recommending that additional site evaluation be performed.)

	X	EXPOSURE TO HAZARDOUS SUBSTANCES OR POLLUTANTS OR CONTAMINANTS			X	ADVERSE WEATHER IMPACTS
		CONTAMINATED DRINKING WATER		FIRE/EXPLOSION THREAT	X	CONTAMINATED SOIL
		DRUMS, BARRELS OR CONTAINERS	X	NO OTHER RESPONSE MECHANISM		OTHER FACTORS

(Identify one or more of the removal actions listed in Section V. REMOVAL ACTIONS WHICH MAY BE APPROPRIATE, as examples of the types of response actions which may be appropriate pending the results of further site evaluation.)

	X	SITE SECURITY	X	DRAINAGE CONTROL		IMPOUNDMENT STABILIZATION
		REMOVAL OF DRUMS, BARRELS, ETC.	X	SOIL CAPPING	X	SOIL EXCAVATION
	X	CONTAIN/TREAT/DISPOSE OF WASTE		CHEMICAL CONTROLS		ALTERNATIVE DRINKING WATER SUPPLIES

COMMENT: Analytical results should be evaluated by EPA risk assessors to determine whether the levels and extent of contamination at the site present an unacceptable risk to human health and the environment that warrants a removal action. Potential activities that may be conducted if a removal action is necessary include installation of restrictive fencing to prevent exposure to fly ash fill material, and excavation, capping, or treatment of approximately 136,111 yd^3 of fly ash on the site property.

SUPERFUND REMOVAL SITE EVALUATION

VII. **ADDITIONAL INFORMATION OR COMMENTS:**

VIII. **CERTIFICATION**

SIGNATURE: **DATE:**
POSITION/TITLE:
OFFICE/AGENCY:

SUPERFUND REMOVAL SITE EVALUATION

(Supplemental Waste Inventory Sheet)

IX. HAZARDOUS SUBSTANCES, POLLUTANTS OR CONTAMINANT INFORMATION:

MATERIAL DESCRIPTION	CONTAINER INFORMATION					
TRADE NAME/ACTIVE INGREDIENTS	NUMBER of CONTAINERS	SIZE	TYPE	SOLID or LIQUID	% FULL	CONDITION